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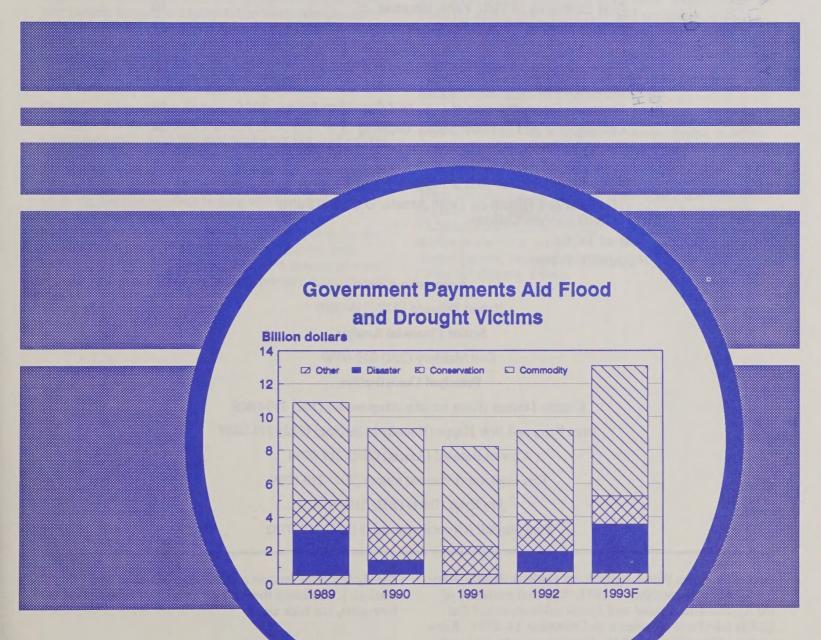
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Situation and Outlook Report



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Summary

Floods and Drought Cut Production, Raise Prices

Summer floods in the Midwest and a drought in the East are taking their toll on 1993/94 corn and soybean production. After 1992's record corn production and the second highest soybean production this year's output will be close to 1991's levels.

Prices have risen dramatically for corn and soybeans, more than offsetting the reduced production, and lifting cash receipt forecasts at the national level because a large portion of calendar 1993's sales will come out of storage. However, many flooded Midwest grain producers and drought-hurt Eastern farmers are likely to see lower receipts and less net income. The bottom line for those directly affected by the adverse weather will depend on how much corn or beans survive the disaster and how much of last year's crop was stored and will be marketed this year.

Direct Government payments are rising this year and over \$2 billion in disaster aid is expected to be disbursed. Deficiency payments made this past spring for last year's crops were high. Total payments are expected to range between \$11 and \$15 billion for this year's program. The revised 1993 net cash income forecast still exceeds the 1992 level, while the forecast net farm income will be lower.

Recent survey results show the average 1992 farm household had an income of \$4,300 from farm sources and \$35,700 from all other sources. About 54 percent of farm households consider farming as their primary occupation;

however, even for these off-farm work can be a major source of income. Off-farm employment in the disaster counties may have been reduced this summer, further affecting farm families' total incomes.

Despite the natural disasters, the overall U.S. farm sector's balance sheet is projected to improve slightly during the year. Farm assets (mostly real estate) are forecast to increase \$9 to \$19 billion, while farm debt is expected to rise \$1-\$2 billion. Farm equity is likely to advance to \$730-\$740 billion, the highest since 1983. Domestic demand for agricultural products should strengthen, with faster economic growth expected in late 1993 or early 1994.

First Farm Income Estimates for 1992 Confirm Earlier Forecasts of Higher Incomes

State and national 1992 net farm income estimates are up from 1991. Last year's weather conditions tended to be extremely favorable, with adequate rain and no excessively high temperatures. This led to record yields and production of several of the major field crops. California and Texas were the top States in net farm income and cash receipts in 1992, with a small earnings gain in both States. These estimates embody changes in data sources and estimation methods for production expenses and "other farm-related income" and rely extensively on USDA's Farm Costs and Returns Survey.

Floods in Midwest, Drought in East Raise U.S. Crop Prices

Floods along the upper Mississippi Basin and drought in the Southeast are affecting field crops throughout the regions. While farmers suffering damage from the floods or drought would likely see cash receipts fall, growers in other parts of the country will benefit from higher prices.

Because of adverse weather in the Midwest and the Southeast, U.S. corn acreage to be harvested is forecast down 5 percent from June's estimate and 11 percent from last year. Soybean acreage for harvest is forecast down 7 percent from June and 3 percent from last year. This forecasted loss of harvested acreage will have a major impact on cash grain farms in the two regions, especially given the pre-harvest costs that farmers had in their growing crops. With fewer acres to harvest and yields returning to trend levels from last year's records, corn and soybean production is forecast down from 1992. However, it is still near 1991 levels.

U.S. Cash Incomes Rise

Farm income will have tremendous regional variations in 1993. Higher prices brought on by the adverse weather conditions in the Midwest and Southeast will benefit producers with crops to sell. Crop cash receipts at the national level are forecast up 1 to 2 percent, with soybeans rising the most (10-14 percent). Receipts for other field crops are forecast down, but vegetable and greenhouse receipts are expected to be up. The expected increase in these receipts for 1993 is a continuation of a long-term trend of rising receipts for specialty commodity components of the farm economy. The increase for 1993 reflects higher prices coming from a stronger overall economy and more production based on increased demand for landscape and house plants. (See Special article.)

Livestock receipts are also forecast up for 1993. Hog and cattle prices have been strong. Production of pork and beef will increase slightly and higher prices in the first half of the year will offset lower prices in the second half, giving a forecast 3 to 5 percent rise in red meat cash receipts. Poultry and egg receipts are forecast up an average 6 to 7 percent. The poultry subsector, much like specialty crops, has been a source of growth in cash receipts for several years. Dairy receipts will likely fall 3-5 percent.

Overall, U.S. expenses are forecast up a modest 1 to 2 percent for 1993. Earlier this year, feed expenses were expected to decline due to lower anticipated corn prices. Now with flood and drought effects factored in, feed prices have risen, but this will only affect feed purchases in the last few months of the year. Current feed expenses on an annual basis are essentially unchanged from last year. The higher feed prices being seen will carry over into next year and have more of an impact on livestock producers then than now.

Most of 1993's Crops Carry Over into 1994

This year's weather will impact crop sales more than just this year. Field crop sales throughout the first three quarters of this calendar year came mostly from last year's stored crop. Nearly two-thirds of the corn and soybean crop is sold in the year after harvest. For 1993, this has meant that any reduced cash incomes due to flood or drought have been partially offset by earlier sales of last year's record crop, even though prices were lower earlier in the year. For 1994, this means less carryover from 1993.

Inventories shifts have a major impact on net farm income, which measures the current year's value of production while adjusting for carryin and carryover stocks. For 1993, the value of the change in inventories is a minus \$1-\$5 billion, mainly reflecting the huge carryin of last year's record production, which was sold this year and will not be replaced due to the flood and drought. This is a subtraction from gross cash income, causing gross farm income for 1993 to rise less than 1 percent from last year. Adding in noncash expenses, such as depreciation, to the expense accounts offsets this slight gross income increase, reducing 1993 net farm incomes 2 to 3 percent. This can be interpreted as saying that net incomes from 1993 production are generally down. Producers with year-earlier crops in storage, and able to sell at current prices could realize positive net cash income for the year. While those with little or no crops from last year could realize a loss.

Midwest Incomes Mainly Affected

Much of the dramatic change in farm income this year will occur in the Midwest. August production forecasts show this region contributing 86 percent of 1993/94 corn and 81 percent of soybeans. The drought-stricken Southeast is expected to contribute only 4 percent of corn and 7 percent of soybeans.

Contrary to reports on the loss of current crop-year production values, calendar 1993 net cash incomes will likely rise in the Midwest, and, perhaps, dramatically so. This will occur for several reasons. First, the region is large geographically, with most acreage unaffected by flood. The eastern Corn Belt will have very good corn and soybean crops by historical standards. Second, fourth-quarter corn prices may rise nearly 15 percent and soybean prices up nearly 25 percent from the fourth quarter of last year. Of course, a farmer has to have a crop to sell to benefit from higher prices. Third, sales for the first half of this year

came from last year's record production, and this year's reduced crop will mainly affect next year's sales.

Many farmers near the flooding rivers will have no production this year and will have to rely on sales of stored grain. This will also affect 1994 when most of this year's crop would normally have been sold. From a cash flow basis, carryin from last year should offset lower 1993 production. From a net farm income sense, many of those producers flooded out will see lower incomes, possibly even negative, as carryin inventories are excluded from this year's sales.

Midwest crop receipts are forecast up over 5 percent for 1993 and livestock receipts up 2 to 3 percent. Anticipated disaster payments of over \$2 billion will also be a contributing factor that could push the region's net cash income up by over 25 percent. These Government payments, on top of regular deficiency and conservation payments, have been approved and should be disbursed quickly as farmers file claims for damage.

Southeast Income Up Slightly

The Southeast is not as dependent on corn and soybeans for earnings as the Midwest. Drought has cut production of these two crops, particularly in Georgia and the Carolinas. However, the Southeast has a much more diverse mix of crops than the Midwest and these other crops, plus broilers, have a stronger influence on the region's receipts. For example, cotton prices were down each quarter of last year and have continued falling this year. Tobacco production is down due to drought (with only slightly higher prices) and lower fruit prices are offsetting much of the expected production increase. Altogether, Southeast crop receipts are forecast down 1 to 2 percent this year.

Meanwhile, livestock receipts are expected to rise 2-4 percent. Aside from stronger cattle and hog prices, broilers are enjoying an exceptional year. Nationally, broiler receipts are forecast up nearly 10 percent and the Southeast, being the major broiler region, will reflect this.

Higher disaster payments will also help push up Government payments in the Southeast by nearly 50 percent. The region's expenses are forecast to follow the U.S. rise of 1 to 2 percent. The combined changes in receipts, payments, and expenses will result in net cash income up 1-2 percent from last year.

Other Regions Mixed

For the Midwest and Southeast, disaster payments are a significant contribution to the overall increase in net cash income. For other parts of the country, disaster payments are a very small fraction of gross income. The commodity mix is playing a larger role in the rest of the country. For example, rice prices have been falling since spring 1992. This year's rice production is also forecast down. The combination of lower prices and production is causing 1993 rice receipts to decline, affecting the South Central region and the West. Higher beef prices are raising South Central livestock receipts, but the large dairy subsector in the West is hurting from lower milk prices.

Although corn and soybeans were heavily affected by the weather, wheat is another story. While the August crop report indicated less wheat in 1993 than earlier expected, the forecast is still for a high production year of 2.6 billion bushels. Prices are down, however. The current 1993/94 marketing-year average price forecast of \$2.55-\$2.95 per bushel is down from last year's \$3.24. This will result in a 5-6 percent drop in calendar 1993 U.S. wheat receipts, which will be felt mostly in the West and the western Midwest.

Table 1—Higher crop prices and disaster aid offset production declines

Desien	Cash receipts		Direct	Gross	Cash	Net cash
Region	Crops	Livestock	Government payments	cash income 1/	expenses	income
			Million	dollars		
1992P Northeast	4,208	7,057	126	11,830	7,989	3,841
Midwest	34,102	35,814	5,017	77,301	56,408	20,893
Southeast	14,236	13,175	435	29,472	15,822	13,649
South Central	9,988	15,083	2,003	28,534	20,995	7,539
West	21,642	15,223	1,588	39,803	28,924	10,878
1993F						
Northeast	4,334	7,005	146	11,938	8,103	3,835
Midwest	36,286	36,593	8,105	83,427	57,100	26,328
Southeast	14,000	13,603	638	29,918	16.034	13,884
South Central	9,560	15,625	2,312	29,004	21,231	7,773
West	21,157	15,416	1,833	39,800	29,332	10,468

P = preliminary; F = forecast.

^{1/} Includes income from other sources not listed.

Flood and Drought Update

- County-level characteristics of USDA's designated disaster areas show the impact of the 1993 flood and drought.
- As of August, Secretary of Agriculture Espy had declared 625 Midwest and 308 Southeast counties as disaster areas eligible for emergency loans. These 933 disaster counties account for about 30 percent of all U.S. counties.
- About one-third of the Midwest disaster counties are also farming-dependent counties, where at least 20 percent of total earned income comes from farming. About one-tenth of the Southeast disaster counties are farming-dependent. Reduced farm income will have a ripple effect on the economy of these local communities.
- The disaster counties contain 32 percent of U.S. farms, but 42 percent of commercial farms (those with sales of at least \$50,000). Of specialized corn farms, 57 percent are located there, and the counties accounted for nearly 32 percent of the value of U.S. agricultural production.
- Farm households in the Midwest disaster counties normally rely more heavily on farm income (26 percent of total Midwest household income) than the U.S. average (12 percent). Farm households in the Southeast disaster counties are less dependent on farm income for family living.



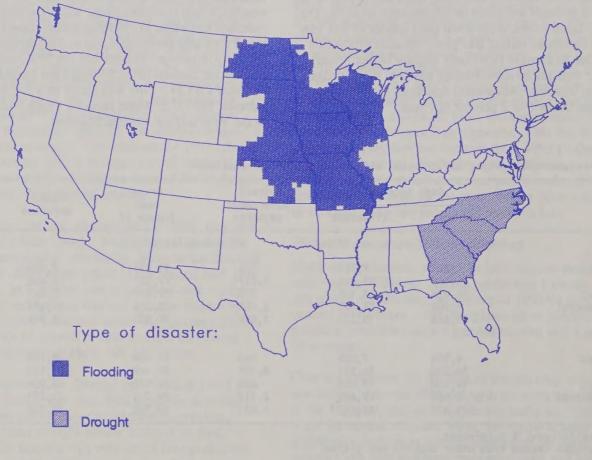
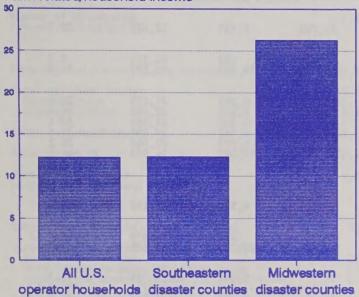


Figure 2
Midwest farm operator households rely heavily on farm income

Farm-related/household income



Source: 1991 FCRS

Disasters Focused on Some Farm Types

Besides location, incomes by type of farm will show considerable variation this year. Effects of the floods will be reflected mainly on cash grain farms, and hog and dairy operations. The drought has affected fewer cash grain farms but additional tobacco farms. The additional crop receipts (primarily corn and soybeans) coming from flood-and drought-induced higher prices will mainly go to cash grain farmers. Some additional crop receipts will go to red meat and dairy operations who also have these crops. Cash grain, red meat, and dairy farms in the disaster counties could also receive the additional disaster payments.

Preliminary forecasts show a 21-percent increase in aggregate net cash incomes accruing to cash grain farms. For these operations, 1993 crop receipt forecasts are up nearly \$2 billion. With most of the disaster payments added in, gross cash income will increase \$3-\$4 billion. Cash expenses are expected to be relatively steady this year, which will leave cash grain farms' net cash income around \$21 billion, up from \$17.4 billion last year.

Red meat operations (beef/hog/sheep) will also see a rise in net incomes this year. They are benefiting from income received from sales of corn and soybeans as well as some disaster payments. If they are buying feed, they have gotten by for most of the year with lower feed costs but are beginning to pay more. Last year net cash income for these producers was minus \$2 billion but this should be recovered this year, netting out at zero.

Not All Farms Showing Improvement

Of course, as with the regional analysis, incomes by farm type are at the sector level, meaning aggregated across all producers in the grouping or class. Within each group,

Table 2—Disaster county farms and production as a percent of U.S. total, 1991

Item	Disaster counties	United States	Disaster counties' share of U.S. 1/
	No	umber	Percent
All farms	663,724	2,099,900	31.6
By sales class of farm: Less than \$50,000 \$50,000 or more	419,899	1,519,611	27.6
(commercial)	243,825	580,289	42.0
Commodity specialization: 2/ Cash Grain Corn Soybeans Other crops Beef, hogs, and sheep Dairy	196,796 64,028 38,779 111,088 249,019 72,586	401,988 111,923 87,555 486,749 898,049 158,469	49.0 57.2 44.3 22.8 27.7 45.8
	Milli	on dollars-	Percent
Value of production Crops Livestock	47,640 22,870 24,770	149,169 76,102 73,067	31.9 30.1 33.9

1/ Column 1 divided by column 2. 2/ Detail does not add to total number of farms because not all commodity specialties are shown separately.

Source: 1991 FCRS.

some producers will have lower incomes and some higher incomes. In the aggregate, cash grain farms' net income is up, but many farmers in the flood or drought counties will have lost production that will not be fully covered by disaster payments or by higher prices for the smaller crop. Also, much of the 1993 crop receipt forecast is coming from sales of last year's record crop that was sold earlier this year. Receipts from sales during the first two or three quarters can offset lost sales of this year's crop in the fourth calendar quarter.

New Household Income Data Released

The May issue of Agricultural Income and Finance reported average incomes of farm operator households for 1988-91. Since then, 1992 Farm Costs and Returns Survey (FCRS) data have become available and 1991 estimates have been revised. The preliminary estimate of average 1992 farm operator household income of \$40,068 compares favorably with the incomes of other households in the Nation.

Average income masks the diversity of farming. An average income figure combines the earnings of people running very large farms (over \$500,000 in gross sales) with those who farm part-time. Farm types also differ. For example, incomes of households running a small apple farm in New York are combined with those operating large feedlots in the Southwest.

Average net cash farm income is an incomplete measure of the well-being of farm families because it ignores the off-farm jobs held by 66 percent of farm-operator households. Average household income is also an incomplete indicator of well-being of farm operator households because the values are spread out. Fifty percent of the households received \$28,846 or less. Thirty percent received more than the average of \$40,068.

Table 3-Average farm operator household income in disaster counties, 1991

Item	Number of households	Distribution of households	Total household income	Farm income	Off-farm income	Farm income as share of total 1/
NIDWEST FLOOD 2/	Number	Percent	Doll	ars per hous	sehold	Percent
All operator households	537,784	100.0	30,798	8,101	22,697	26.3
By sales class of farm: Less than \$50,000 \$50,000 or more (commercial)	321,253 216,531	59.7 40.3	28,826 33,725	652 19,152	28,174 14,572	2.3 56.8
Commodity specialization: 3/ Cash Grain Corn Soybeans Other crops Beef, hogs, and sheep Dairy	187,988 62,010 34,768 60,732 202,711 69,089	35.0 11.5 6.5 11.3 37.7 12.8	30,729 32,308 30,707 37,981 29,625 27,037	8,893 9,822 9,343 8,961 5,978 12,049	21,835 22,486 21,364 29,021 23,648 14,988	28.9 30.4 30.4 23.6 20.2 44.6
SOUTHEASTERN DROUGHT						
All operator households	121,821	100.0	36,685	4,532	32,152	12.4
By sales class of farm: Less than \$50,000 \$50,000 or more (commercial)	96,631 25,191	79.3 20.7	33,392 49,314	-227 22,789	33,619 26,525	-0.7 4/ 46.2
Commodity specialization: 3/ Cash Grain Corn Soybeans Other crops Beef, hogs, and sheep Dairy	8,539 1,902 3,990 49,487 43,522 3,361	7.0 1.6 3.3 40.6 35.7 2.8	31,271 21,844 11,734 41,789 30,066 31,855	5,096 -4,867 -9,602 11,380 -1,885 1,500	26,176 26,711 21,336 30,409 31,951 30,355	16.3 -22.3 4/ -81.8 4/ 27.2 -6.3 4/ 4.7
ALL DISASTER COUNTIES						
All operator households	659,605	100.0	31,885	7,442	24,444	23.3
By sales class of farm: Less than \$50,000 \$50,000 or more (commercial)	417,883 241,722	63.4 36.6	29,882 35,349	448 19,531	29,433 15,818	1.5 55.3
Commodity specialization: 3/ Cash Grain Corn Soybeans Other crops Beef, hogs, and sheep Dairy	196,527 63,912 38,757 110,219 246,234 72,450	29.8 9.7 5.9 16.7 37.3 11.0	30,752 31,997 28,754 39,691 29,703 27,260	8,728 9,385 7,393 10,047 4,588 11,560	22,024 22,612 21,361 29,644 25,115 15,701	28.4 29.3 25.7 25.3 15.4 42.4

1/ Column 4 divided by column 3. 2/ Includes other weather related damage in the flood area. 3/ Some specialties are not shown separately. 4/ Percentages are negative if farm income is negative. Source: 1991 FCRS.

Types of Farm Households

Three mutually exclusive groups of farm households can be identified:

- Households with commercial farms In 1992 some households operated farms that were large enough to have the potential to support the family and required substantial time from the operator. The farm was commercial-sized (sales of \$50,000 or more) and the operator devoted most of his/her work time to farming in 24 percent of the households. Almost 61 percent of full-time commercial farming households received more income from farming than from off-farm sources.
- Households successfully combining farm and off-farm income These households were able to successfully combine farm work with off-farm income. Most operators in this group spent most of their work time off-farm. For these 54 percent of operator households, average farm income was negative.

• Low-income households Not every household was welloff. Twenty two percent had both low farm income and low off-farm earnings. These households had total income below \$15,000 (approximately the poverty threshold for a family of four).

Households with Commercial Farms

Commercial farms (gross sales of \$50,000 or more) are important to agriculture. One-fourth of all farms are commercial-sized and have an operator reporting farming as the major occupation. These farms received 75 percent of 1992 direct Government farm program payments. The average farm net worth was \$618,000 and the operators controlled 62 percent of the acres operated.

Households operating these commercial farms, on average, do well economically. They are the most likely farms to be in a favorable financial position, with positive income and low debt/asset ratios. Because they receive a large share of sector farm income, their average returns on as-

Table 4—Selected characteristics of farm operator households, by household type, 1992

		Household type 1/	
	Operating commercial farms	Combining farm and off-farm income	Low
Number of households Percent of households	497,568	1,125,969 54.3	448,412 21.6
		Dollars per household	
Farm-related income to the household	26,519	-817	-7,334
Total off-farm income Earned income Unearned income	19,197 13,087 6,110	52,667 41,536 11,131	11,550 6,031 5,519
Total household income	45,716	51,850	4,216
Farm net worth	618,048	243,163	230,626
Government payments Percent of government payments	9,302 75.2	982 18.0	939 6.8
Someone in household worked off-farm	52.7	Percent 81.0	42.7
Farm income compared with off-farm income: No off-farm income Farm income imbelow off-farm income Farm income equal or above off-farm income	18.4 39.4 42.2	95.7 2/ 4.3	9.5 84.8 5.7
Type of commodity speciality: Cash grains Other crops Beef, hogs, or sheep Other livestock Dairy	31.8 17.6 24.7 4.9 21.0	14.4 25.3 50.2 8.3 1.8	15.1 24.4 50.5 6.5 3.5
U.S. region: Northeast Midwest South	7.0 55.6 23.6 13.9	5.9 36.0 45.5 12.6	6.6 35.0 45.7 12.7
Operator's education: Less than high school High school graduate, no college College College degree or beyond	15.4 46.0 23.3 15.3	17.7 39.6 22.0 20.7	39.3 40.4 12.6 7.7
Operator's stated major occupation: Farm work Something else	100.0	29.4 70.6	65.4 34.6
Operator's average age (years)	50	53	59

1/ Households operating commercial farms have farm sales of at least \$50,000 and an operator whose major occupation is farming. We divide the remaining households into two categories: households which have income at or above \$15,000 (combining farm and off-farm income) and below \$15,000 (low income households). 2/ Two cells were combined to avoid data disclosure.

Source: Preliminary estimate from the 1992 Farm Costs and Returns Survey, all versions.

sets and equity are higher than other farm categories. These households received higher average farm income than other farm households.

Even in this commercially viable group, some households were not in solid financial shape: 25 percent lost money farming in 1992; 27 percent had debt/asset ratios over 0.40; and 30 percent had low total household income.

Commercial farms are concentrated in the Midwest, where the commodities produced are more likely to be cash grains or dairy. The operators tended to be younger than other farm operators and had more education.

Time that household members devote to farming often leaves little time for off-farm work. About 50 percent of the households earned money from jobs or businesses off the farm. Even so, on average, households operating com-

mercial-sized farms still received 42 percent of their household income from non-farm sources.

Households Successfully Combining Farm and Off-Farm Income

Many farm operators spend the majority of worktime in pursuits other than farming. These farms contribute minority of the value of farm production. Most of these farms are small part-time businesses. In 1992, 63 percent of these households lost money farming. Two percent ran farms in a marginally solvent financial position (positive net farm income but high debt). While farm income was important for some of these households, it was not the major source of income. For example, 80 percent of average household income came from wages, salaries or off-farm business. Another 21 percent was from unearned income sources such as investments, Social Security, and other off-farm sources. (Since average farm income was

negative, off-farm income sources are be 101 percent of total household income)

Low Income Households

Some farm operator households have neither the farm assets to generate sufficient income to support a family, may the opportunity to successfully combine farm and nonfarm sources of income. Only 22 percent of households were in this category. Their farm income and off-farm income combined was below \$15,000 (approximately the poverty threshold for a family of four). On average, operators of farms in this category are older and less well educated. Their farms are small whether measured by acreage, sales, or net worth. Only 32 percent of the farms were in a favorable financial position with positive net incomes and low debt.

Importance of Rural Employment Opportunities

Traditional farm commodity programs are most likely to have an impact on households running a commercial farm and specializing in program commodities. Economic development in rural areas is probably most important to households successfully combining farm and off-farm income. A growing local economy allows them to improve their off-farm earnings, which already provide most of their income. Rural development might also help low-income households find work off the farm. However, low-in-

come households might also benefit from efforts targeted toward them, such an educational and training programs.

Flood and Drought Affect Off-farm Jobs

This year's adverse weather will have m impact on many farm households in disaster counties for two reasons. First, farm households in the midwestern disaster counties rely heavily m farm income. Farm-related income made up 26 percent of operator household income in the midwestern disaster counties, compared with 12 percent for both the Nation m whole and the Southeastern disaster counties (fig. 1). Second, the adverse weather may also affect off-farm jobs held by members of operator households. For example, floods might close businesses where members of operator households work off-farm. And, nonfarm businesses that process agricultural products or supply farm inputs will be affected by the weather's adverse impact on farming.

Finally, some households depend more heavily on farming than others and will be affected more by bad weather. Regardless of weather problems or location, households operating commercial farms depend more heavily on farm income than households operating small farms (table 4). Households running dairy farms in Midwestern disaster counties depend more on farm income than other households in these counties.

Farm Assets and Equity Continue Improvement in 1993

Farm asset values are rising, led by increases in land values. Debt may rise slightly. Consequently, 1993 farm equity is expected to increase.

Despite localized hardships resulting from 1993's natural disasters, the overall U.S. farm sector's financial position is projected to improve slightly during the year. Farm real estate values may increase modestly, while farm debt is expected to rise \$1-\$2 billion. Farm equity is likely to be \$730-\$740 billion, the highest since 1983.

Farm Assets Up Slightly

The value of U.S. farm business assets (excluding operator households) is forecast to be \$870-\$880 billion on December 31, 1993, up 1 to 2 percent from 1992. The increase is due mainly to rising farm real estate values, which account for almost 74 percent of all farm business assets.

Nonreal estate assets are expected to increase less than 1 percent in 1993. Livestock and poultry year-end inventory values are expected to rise about 1 percent, remaining in the \$70-\$74 billion range. The farm value of machinery and equipment, which fell slightly in 1992, is expected to show another modest decline in 1993 despite a possible rise in sales. Since 1989, machinery values have remained within the range of \$85-\$86 billion. Any decline in year-end crop inventory quantities are expected to be offset by higher prices, so that crop inventory values are anticipated to remain in the \$23-\$27 billion range. Farm financial assets are expected to continue increasing slightly to \$43-\$47 billion by the end of 1993.

Farm Dabl Expected To Rise

Total farm business debt declined slightly in 1992, following a modest increase in 1991. The 1991 rise had marked the end of 6 consecutive years of debt reduction. Total debt is anticipated to rise 1-2 percent in 1993, depending on the ultimate role that farm loans play in disaster assistance packages. The \$1.7-billion decrease in Farmers Home Administration (FmHA) direct loans in 1992 more than offset the \$1.2-billion increase in debt held by other lenders. FmHA debt could drop another \$2 billion in 1993, as the agency works through its remaining problem-loan portfolio, and continues to shift emphasis to guaranteed loan programs.

Reluctance by farmers to expand operations or to invest in new machinery and equipment translated into limited demand for farm loans in 1992. Farmers and lenders are expected to maintain a conservative approach toward debt-financed expansion, uncertainty about the strength of the economic recovery dampens the demand for new loans.

Real and Nonreal Estate Debt To Rise in 1993

Farm real estate debt rose less than 1 percent in 1992, and is forecast to rise by a similar amount in 1993. Real estate lending by the Farm Credit System (FCS) rose slightly in 1992, significant only because it marked the FCS' first increase in mortgage debt since 1984. However, commercial banks continued to gain in the market for loans secured by farm real estate, a banks' mortgage loans increased over \$1.3 billion in 1992.

Banks, which accounted for only 9 percent of all farm real estate loans in 1984, are expected to have market share of about 25 percent of farm real estate lending by the end of 1993. FCS' share of real estate loans will have declined from almost 44 percent in 1984 to about 34 percent by the end of 1993. Life insurance companies packaged and sold a limited selection of their existing farm mortgages through Farmer Mac in 1992, and are expected to continue to do so in 1993.

Nonreal estate debt fell by less than 2 percent in 1992, but is expected to increase by over 2 percent in 1993. The decline in 1992 was due mainly to a \$1.1-billion decrease in FmHA nonreal estate direct loans. The FCS contributed to the decline, as its nonreal estate loans fell by over 2.5 percent, the first decline since 1988. Commercial bank nonreal estate lending, rising marginally, showed its smallest increase since its last decline in 1987.

FCS and bank nonreal estate lending patterns during 1992 may reflect the growing role of input suppliers and other nontraditional lenders. In a low interest rate environment, these suppliers are finding it profitable to provide favorable financing as a mean to increase sales. These suppliers are effectively providing agricultural production loans to purchasers of their products, decreasing the demand for seasonal production loans traditionally provided by banks and the FCS. Loans held by these nontraditional lenders, included as individuals and others in the farm sector accounts, are expected to increase by over 7 percent in 1993.

Equity and Returns

Farm business equity is expected to increase between 1 and 2 percent during 1993, rising \$10-\$15 billion by year-end. Farm equity fell from \$816.3 billion at the end of 1980 to \$567.5 billion by 1986. In rising to \$730-\$740 billion by the end of 1993, equity will have regained nearly \$170 billion of the \$250 billion decline experienced during the early 1980's. Real farm equity (measured in 1987 dollars) is forecast to fall for the fifth consecutive year.

Rising farm income levels, coupled with moderately rising farm sector asset values, continue to produce relatively high returns to farm assets and equity. If returns to farm assets rise faster than farm assets in 1993, the rate of return on farm assets from current income is expected to increase to between 3 and 5 percent. The rate of return on equity from current income is expected to be 2 to 4 percent in 1993.

The projected total real (1987=100) rate of return on assets, which includes returns from current income and returns from real capital gains, is expected to be between 2

and 3 percent in 1993. This reflects modest increases in both returns to farm assets and land values. The total real rate of return on equity is expected to be less than 2 percent.

The spread (total real return on assets minus the real cost of debt) is expected to be between -3 and -4 percent in 1993. While indicating that debt financing may not be profitable in 1993, the spread does show improvement over its 1992 value.

Table 5—Farm Credit System farm business loan volume stabilizes 1/

Lender	1983	1987	1990	1991	1992	1993F
		Millio	n dollars		Bill	ion dollars
Real estate Farm Credit System Farmers None Administration Life insurance companies Commercial banks CCC storage facility Individuals & others	103,176 44,316 8,572 11,666 8,347 888 29,386	82,387 30,642 9,429 9,352 13,541 46 19,377	73,702 25,255 7,580 9,641 16,165 7	74,446 25,100 6,999 9,495 17,315 4 15,533	75 6 19 2/ 16	73 to 77 25 to 27 5 to 6 0 to 10 15 to 20 2/ 16 to 15
Nonreal estate Commercial banks Farm Credit System Farmers Home Administration Individuals & others	87,888 37,075 19,392 12,855 18,566	62,012 27,589 9,384 14,123 10,916	63,080 31,267 9,699 9,374 12,740	64,308 32,854 10,256 8,213 12,985	33 10 7 13	63 to 67 34 to 36 V to 11 5 to 8 13 to 16
Total deal (excluding CCC) Farm Credit System Farmers Home Administration Commercial banks Life insurance companies Individuals Lothers	191,064 63,708 21,427 45,422 11,666 48,840	144,399 40,026 23,552 41,130 9,352 30,338	136,782 34,954 16,954 47,432 9,641 27,801	138,754 35,356 15,212 50,169 9,495 28,522	35 14 52 9 29	137 to 143 34 to 36 11 to 13 52 to 54 E to 10 30 to 32

F = forecast. 1/ Excludes CCC commodity loans. 2/ = less than \$4,000,000.

Table 6—Real farm business balance sheet shows assets and equity lagging inflation 1/

Year		Current dollars		De	flated 1987 dollar	rs 2/
Teal	Assets	Debt	Equity	Assets	Debt	Equity
			Billio	n dollars		
1987-89	801.2	140.3	660.8	769.5	135.0	634.4
1990	848.4	136.8	711.6	749.5	120.8	628.6
1991	843.9	138.8	705.1	716.4	117.8	598.6
1992	861.2	138.3	722.9	711.7	114.3	597.4
1993F	870 to 880	137 to 143	730 to 740	700 to 710	109 to 115	585 to 595

F = forecast. 1/ Excludes CCC commodity loans. 2/ Deflated by GDP implicit price deflator.

Table 7-Rates of return on farm business assets and equity improve 1/

		Returns to assets			Returns to equity			
	Income	Real capital gains	Total	Income	Real capital gains	Total		
			Per	cent				
1987-89	4.5	0.7	5.2	3.4	0.6	4.0		
1990	4.6	-2.5	-2.1	3.7	-4.0	3		
1991	3.8	-4.3	5	3.0	-6.0	-3.0		
1992	3.9	8	3.1	3.1	-1.5	1.7		
1993F	3 to 5	-2 to 0	2 to 3	2 to 4	-3 to -1	1 to 2		

F = forecast. Totals may not add due to rounding. 1/ Excludes CCC commodity loans. Returns to assets and equity are calculated using the average of the current and previous years' assets and equity, respectively.

Economic Recovery Slowed in the First Half of 1993

Growth expected to accelerate slightly in late 1993 or early 1994. Domestic demand for agricultural products should strengthen with economic growth.

In the second half of 1992, the economic recovery gained momentum; real GDP grew at a rate of 4.6 percent annually. In the first half of 1993, the economy lost momentum as real GDP growth slowed to 1.3 percent annually; 0.8 percent in the first quarter, and 1.8 percent in the second. Economic growth remains the slowest of any recovery since post World War II.

Second-quarter GDP growth was held down by a reduction in inventories. Total inventory accumulation slowed by \$15.4 billion in the second quarter as firms responded to weaker-than-anticipated first-quarter sales. Real final sales, which are a more accurate barometer of final demand than GDP, increased at an annual rate of 3.1 percent in the second quarter after declining 0.8 percent in the first quarter.

Business investment spending has remained a primary source of strength to the economic recovery and increased at an annual rate of 14.4 percent in the first half of 1993. Virtually all the increase has been in business equipment spending, spurred by more advanced and cheaper equipment, such as small computers, and lower costs of debt and equity capital. Intense domestic and foreign competition has also increased efforts by firms to raise investment and productivity.

Personal consumption rebounded in the second quarter of 1993 and grew at an annual rate of 3.2 percent compared to 0.8 percent in the first quarter. This 3.2-percent increase occurred in conjunction with an annual growth of 6.0 percent in real personal disposable income. However, in the second quarter, the savings rose to 4.5 percent from 3.9 percent in the first quarter. The saving rate remains low by historical standards, averaging 6.1 percent from 1980 to 1992. Lower interest rates have reduced the savings rate by reducing total interest charges on existing variable rate debt well as the interest rate on new debt.

The U.S net export position continued to deteriorate in the first half of 1993, reaching a deficit of \$73 billion in the second quarter. The trade deficit widened, reflecting overall slow economic growth among U.S. trading partners relative to the United States. The overall real value of the dollar relative to most of its major trading partners has strengthened since the summer of 1992, further weakening the near-term trade outlook.

Inflation and Long-Term Interest Autor Fall in Spring and Summer

Inflation moved up slightly in the late fall and winter of 1992-93. Inflation, as measured by producer and consumer price indexes increased 1.4 and 2.9 percent, respectively, in 1992. However, producer and consumer prices increased at 4.7 and 4.3 percent, respectively, in the first 4 months of 1993. The increase in inflation in early 1993 increased fears that the higher rate would persist.

Inflation moderated sharply in the May-July period as producer prices declined by 1.6 percent and consumer prices increased at an annual rate of 0.8 percent. The recent moderation of inflation has been a major factor in the continuing decline of nominal and real U.S. long-term interest rates. Lower real long-term interest rates encourage greater private investment by reducing the cost of long-term funds. In addition to lower inflation, long-term bond yields have been pushed sharply downward by continued slow economic growth, the passage of the Federal Government deficit reduction package, and the likelihood of continuing declines in foreign interest rates. From December 1992 through the end of August 1993, yields on long-term Treasury bonds and high-grade corporate bonds have fallen from 7.30 and 7.98 percent to 6.00 and 6.65 percent.

Job Growth Remains Slow

Job growth is slow in this recovery, which undoubtedly has reduced consumer confidence and slowed purchases of consumer durables and housing. Total nonagricultural employment this year increased at an annual rate of 1.9 percent through July.

From December 1992 through July 1993, employment actually declined in the manufacturing sector, although production of manufactured goods expanded at a 3.0 percent annual rate. In this recovery, manufacturers have favored expanding the average employee work week instead of adding new employees. In July, the average work week in manufacturing grew to 41.4 hours from 40.4 hours in the 1980's.

Near-Term Outlook is for Continuing Slow Growth and Low Inflation

Slow growth and low inflation are expected to continue. The large accumulation of debt in the 1980's has constrained spending by consumers and businesses and lending by banks in the 1990's. The debt overhang problem reduced consumer liquidity and confidence in a time of slow job and income growth. Business spending on investment

and personnel hiring has been constrained by high debt loads that raised borrowing costs and generated cash flow constraints.

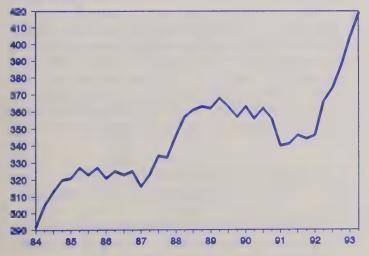
Commercial banks, constrained by heavier-than-normal loan losses, a reduction in overall loan quality, and higher capital needs, reduced lending. The debt problem has been reduced as individuals, businesses, and commercial banks adjusted their balance sheets and spending to increase liquidity and reduced overall reliance upon debt. These balance sheet adjustments have improved the ability of consumers and businesses to spend and commercial banks to lend.

Lower interest rates and inflation have also improved the economic outlook. The dramatic fall in long-term interest rates has reduced significantly the cost of these funds for business investment. The slowing of inflation during late spring and summer has reduced expectations and uncertainty concerning inflation, increased the affordability of home mortgages, and reduced the impact of inflation-generated distortions on saving and investment decisions. Lower real after tax costs of funds for businesses and consumers should strengthen business investment and consumer spending on durables and residential construction in the remainder of 1993 and 1994.

Through year's end, interest rates should remain near currently very low levels. Economic growth is likely to grow modestly for the remainder of 1993. However, only modest domestic upward pressure is generated on interest rates. In addition, foreign central banks are likely to control world-wide interest rates are ease monetary policies to counteract their recessions and slow growth.

Growth in 1994 and beyond should benefit from recent and continued business capital spending and Federal Gov-

Figure 3
Real business equipment spending is up
Billion dollars



ernment efforts to reduce federal deficits. Productivity and long-term growth depends on many factors, including the size and skills of the Nation's labor force, private capital stock, transportation, education, and legal systems. Over the 1980's, real business spending on equipment grew at annual rate of 2.6 percent. Since bottoming out in the first quarter of 1991, this spending has grown a 9.7-percent annual rate. Business spending on equipment is likely to remain brisk and the productivity of the nation's labor force is likely to grow as it becomes accustomed to the higher-quality capital stock. Greater private investment should improve the longer term growth outlook.

The budget deficit reduction plan probably slow economic growth slightly as the net government demand for resources declines. However, deficit reductions occur, more private funds should be available for investment and overall real U.S. interest rates should be lower. The situation will lower the real price of U.S. goods abroad and increase U.S. exports. Economic growth is expected to be stronger for our major trading partners in 1994.

Demand for Agricultural Products

Domestic demand for agricultural products should strengthen as economic growth improves. Inflation and interest should remain low, keeping increases in agricultural production costs modest. Prospective lower intermediate and long-term interest rates facing farmers in the second half of 1993 may encourage some additional long-term investment by them. Volatile exchange rates will add volatility to foreign demand for agricultural products. Near-term foreign demand for agricultural products will continue to be constrained by weak economies in much of Western Europe and Japan.

Figure 4
Long term interest rates declining sharply
Percent



First Estimates of 1992 Farm Incomes

Detailed 1992 State estimates show net farm income up from 1991. Weather conditions in 1992 tended to be extremely favorable with adequate rain and an absence of high temperatures in summer and early fall. This led to record yields and production of several major field crops.

The first release of the 1992 U.S. and State farm income estimates is now available (previously only forecasts at the national and regional levels had been available). These estimates reflect complete-year data that run only be collected following the end of the year. Much of the critical data for the major commodities and expenses commodities and expenses commodities and expenses commodities and expenses commodities are described by the revised over several years as additional data become available. The income estimates reflect national and regional data from the USDA's Farm Costs and Returns Survey. In addition, State data reflect the 1987 Census of Agriculture and the 1988 Agricultural Economics and Land Ownership Survey.

U.S. agriculture continues to recover from the financial crisis that affected farmers and ranchers in the early to mid-1980's. Progress is evidenced by the rapid rise in the farm sector's income measures through 1989. Income remained steady in 1990, dipped in 1991, and recovered in 1992 with the manifelal weather conditions and exceptional production.

Measured in real (1987) dollars, U.S. farmers did about as well as they have done for the past several decades. Earnings, while high, were certainly not out of line with historical levels. The movement in livestock receipts to levels consistently above crop receipts since 1984 contributed to the overall rise in farm income.

The story in 1992 was the near perfect weather conditions, resulting in exceptional production for numerous commodities, led by corn, which achieved a record-shattering national average yield of 131 bushels per acre. Yields were high for all major field crops harvested in both summer and fall. Corn and soybeans had record-setting harvests in 1992, boosting cash receipts for crops to an all-time high. Corn and soybean prices declined in the second half of the year the size of the harvest became apparent, but held up surprisingly well because of favorable demand. Milk production was up 2 percent in 1992 as output per cow more than offset a decline in the dairy herd. Mild temperatures in late surger and early fall contributed to the record harvest of fall crops, avoided heat stress on cows, and mitigated the seasonal decline in the annual milk production cycle.

Net farm income was up in 1992 from 1991, reflecting un increase in the farm sector's net product. The total of cash receipts and inventory change reflects the value of the sec-

tor's commodity production for the calendar year. This combination excludes quantities of commodities used inputs on the farms where produced and thus avoids double counting.

Corn, so both the Nation's most important crop and the one most sensitive to weather conditions, serves as barometer of aggregate production within the agricultural sector. Thus, when the corn harvest is subject to significant year-to-year change, net farm income can be expected to follow suit. Cash receipts from sales of crops were up \$2.9 billion and additions to crop inventories were another \$2.8 billion. This \$5.7 billion accounted for the lion's share of the \$8.6-billion gain in net farm income.

The value of livestock production changed little in 1992, with a net contribution of about half a billion dollars more than in 1991. The value of additions to inventories (\$922 million) was about double the decline in cash receipts from livestock and products (\$422 million). The mild summer temperatures contributed substantially to higher production of crops. Livestock also had positive effects, most noticeably in milk sales. Record crop harvests also meant abundant supplies of feed crops at favorable prices in the latter part of 1992 and into 1993.

While not a direct measure of production, net cash income is nevertheless influenced by production. With production expenses in 1992 remaining essentially unchanged from 1991, cash receipts become the principal determinant of net cash income, which in turn rose by \$4.4 billion. The value and percentage increase in net cash income was less than that of net farm income because the former does not reflect the large additions to end-of-year inventories, which is typical of years with significant gains in production. Farmers tend to put large quantities in storage, anticipating or hoping for a rise in price after a few months when markets have had time to adjust to the abundant supply.

California and Texas Lead in Income

As usual, California and Texas were the top two States in net farm income in 1992, following small earnings gains. Four additional States, Florida (the third-ranking State), Nebraska, Iowa, and North Carolina had net incomes of at least \$2 billion. States that be big producers of corn, soybeans, and other field crops (e.g., Nebraska and Iowa) had substantial jumps in farm income in 1992. Farm income was stable in States in which the leading commodities are

specialty crops (e.g., California, Florida, and North Carolina), as they are prone to be. Farm income tended to change little in States where livestock predominates. Overall, the top 10 States accounted for \$25.2 billion, or 52 percent, of U.S. net farm income, compared to 54 percent in 1991.

Net farm income rose in 43 States in 1992, with a median increase of 16.5 percent. Net farm income in the remaining seven States showed a median decrease of 7.4 percent. The States with the largest percentage increases tended to be those with a production mix oriented toward the major field crops, and to a lesser extent, dairy. This is evidenced by Indiana and Illinois being ranked number one and number two in year-to-year improvement. Indiana and Illinois had whopping average come yields of 147 and 149 bushels per and in 1992. For Indiana, that was a year-to-year gain of 55 bushels, which is why it had the largest percentage gain in net farm income. Producers of livestock and specialty crops generally experienced stable incomes.

Rankings of net farm income per operation and per acre did not change dramatically from 1991. The macroeconomic and climatic forces that affect and constrain agricultural production and marketing displayed no significant regional differences. Among the important macro forces economic conditions, weather, and Government farm programs. For example, the positive effects of the nearly perfect weather were nationwide.

As is usually the case, States producing greenhouse/nursery products, citrus, and vegetables tend to lead the rankings on both a per operation and per acre basis. These States tend to be heavily populated, coastal States, where land values are high and farming must compete with non-agricultural uses of the land. As a consequence, only high-value crops are outbid the competition in these States. In contrast, the principal farm income States (in the Midwest) and the major livestock producing States tend to be ranked lower una per-operation and per-acre basis. Grain and livestock production tend to be associated with low per operation and low per acre net farm income.

The top 10 States, as ranked by aggregate net farm income, experienced some minor shuffling of positions but only one change in membership from the prior year with eighth-placed Illinois replacing South Dakota, following a move from the 20th spot in 1991. Indiana staged an even more dramatic jump in rank (from 41st to 24th) but its production base is not large enough to qualify it for a top-10 ranking.

The composition of the 10 leading States in net farm income per operation was unchanged, even though some States within the group shifted up or down by no more than 1 position. This stability exists because the size of operations and the mix of commodities produced tend to change only gradually.

Likewise, no change occurred in the composition or position of the 10 leading States in per-acre net farm income. The commodity mix produced within States is dictated by

climate, land type, productivity, and other determinants of comparative economic advantages that typically change at a very slow pace. The cumulative effects of persistent trends do appear in the rankings as evidenced by California's slippage in rank over recent years. California's agricultural production has undergone adversity in competitive advantage due to the rising costs of irrigation water and the reemergence of the Southeastern States competitors in cotton production, following a successful boll weevil eradication program.

States ranked highest in per operation net farm income tended to be located in the Southeast, Northeast, and Pacific Coast regions. The leading States in regards to net farm income per acre were all coastal States. This reflects production of specialty crops (e.g., greenhouse and nursery crops) and poultry in these regions. Appalachian, Delta, Lake, and Corn Belt States all tended to have moderate net farm income per operation and per acre. The Northern Plains, Southern Plains, and Mountain States had high income per operation and low income per acre, indicative of large operations with low-value products on a per acre basis.

Production Expenses

Total production expenses were virtually unchanged in 1992, declining less that 1 percent from 1991. Declines in intermediate product expenses (1.6 percent) and interest (5.8 percent) were partially offset by increases in net rent paid to nonoperator landlords (5.4 percent) and property taxes (4 percent).

Among the States, expense changes were not significant. More States experienced decreases in expenses (32) than increases (18), but changes in either direction tended to be small. The median increase was only 1.1 percent and the median decrease was 1.2 percent. No discernible regional or commodity-related pattern of change was of enough consequence to report.

The composition and rank of the top 10 States in total expenses remained unchanged from the prior year, with the exception of Missouri and Arkansas which switched positions in the 10th and 11th slots. These top 10 States accounted for 52 percent of total expenses, which is identical to their share of the cumulative total in the previous year. Per operation and per acre rankings remained essentially unchanged. Increases in per farm expenses usually occurred because the number of farms in a State dropped, rather than the mix of commodities produced in State which tends to change slowly, if at all.

Florida, North Carolina, and Georgia, among the top 10 States in net farm income, were outside this group in expenses, reflection of the high-value commodities produced-broilers, greenhouse/nursery crops, tobacco, and fruit. Conversely, Wisconsin, Indiana, and Missouri were among the top 10 in total expenses but were outside in net farm income, reflection of their position major producers of milk and grains.

Table 8—Net farm income for States, 1991-92

		1991		1992			
State	Gross farm income	Total production expenses	Net farm income	Gross farm income	Total production expenses	Net farm	
			1,000	dollars			
l abama	3,518,296	2,294,190	1,224,106	3,368,939	2,227,590	1,141,349	
laska	33,056	26,594	6,462	32,696	26,710	5,986	
rizona	2,026,903	1,359,073	667,830	1,954,079	1,359,308	594,771	
rkansas	5,117,834	4,243,580	874,254	5,397,581	3,992,684	1,404,897	
alifornia	19,119,525	15,068,050	4,051,475	19,539,113	14,782,860	4,756,253	
olorado	4,336,321	3,491,226	845,095	4,426,345	3,479,416	946,929	
onnecticut	503,138	332,663	170,475	526,975	337,057	189,918	
elaware	697,599	563,265	134,334	695,928	560,563	135,365	
lorida	6,359,583	3,615,489	2,744,094	6,371,687	3,595,195	2,776,492	
Georgia	4,598,631	3,102,249	1,496,382	4,716,146	3,035,544	1,680,602	
lawa i i	581,312	560,631	20,681	580,772	553,615	27,157	
daho	2,953,229	2,088,119	865,110	3,025,248	2,086,052	939,196	
llinois	8,099,833	7,392,201	707,632	9,268,065	7,569,244	1,698,821	
ndiana	4,758,590	4,600,044	158,546	5,469,116	4,739,780	729,336	
lowa	11,172,313	9,487,623	1,684,690	12,111,069	9,646,421	2,404,040	
Cansas	7,952,568	6,671,284	1,281,284	8,383,710	6,661,069	1,722,641	
entucky	3,596,978	2,527,464	1,069,514	3,821,329	2,514,241	1,307,088	
ouisiana	2,138,781	1,844,302	294,479	2,259,135	1,768,454	490,681	
laine	534,796	412,883	121,913	550,272	412,736	137,536	
lary land	1,532,641	1,205,749	326,892	1,596,084	1,207,914	388,170	
lassachusetts	537,063	358,259	178,804	555,999	355,878	200,121	
lichigan	3,756,340	3,239,141	517,199	3,787,046	3,206,388	580,658	
linnesota	7,885,034	6,614,386	1,270,648	7,975,471	6,495,010	1,480,461	
lississippi	2,995,798	2,623,310	372,488	3,211,300	2,537,603	673,697	
lissouri	4,700,117	4,117,912	582,205	5,127,426	4,252,592	874,834	
lontana	2,207,780	1,631,242	576,538	2,085,103	1,622,651	462,452	
lebraska	9,801,575	7,378,815	2,422,760	9,970,422	7,278,043	2,692,379	
levada	299 395	218,715	80,680	267,574	211,220	56,354	
Www Hampshire	173,868	138,216	35,652	183,718	138,792	44,926	
New Jersey	751,424	564,567	186,857	769,803	557,272	212,531	
Mexico	1,642,243	1,214,979	427,264	1,674,256	1,182,902	491,354	
lew York	3,087,406	2,543,998	543,408	3,174,077	2,551,819	622,258	
orth Carolina	5,975,064	3,513,826	2,461,238	6,088,226	3,635,362	2,452,864	
lorth Dakota	3,342,152	2,648,756	693,396	3,809,419	2,718,204	1,091,215	
Ohio	4,653,517	3,849,228	804, 289	5,095,689	3,881,743	1,213,946	
Oklahoma	4,371,985	3,508,598	863,387	4,350,291	3,267,434	1,082,857	
regon	2,952,176	2,325,511	626,665	3,018,523	2,322,580	695,943	
Pennsylvania	3,689,198	3,212,616	476,582	4,008,847	3,176,803	832,044	
thode Island	76,746	44,438	32,308	80,354	44,580	35,774	
South Carolina	1,421,246	1,059,137	362,109	1,361,751	1,023,378	338,373	
South Dakota	3,902,680	2,579,086	1,323,594	3,952,786	2,558,316	1,394,470	
l'ennessee	2,393,397	1,970,514	422,883	2,606,040	1,997,737	608,303	
Texas	14,184,429	11,214,433	2,969,996	14,236,117	10,772,114	3,464,003	
Jtah	829,562	605,945	223,617	893,069	611,664	281,405	
/ermont	472,138	397,035	75,103	528,799	396,046	132,753	
/irginia	2,449,061	1,832,230	616,831	2,494,854	1,867,793	627,061	
lash ington	4,690,737	3,647,272	1,043,465	5,006,463	3,669,791	1,336,672	
Jest Virginia	433,556	364,466	69,090	440,015	360,972	79,043	
lisconsin	5,989,424	5,202,753	786,671	5,971,056	5,159,795	811,261	
Wyoming	1,031,951	800,562	231,389	922,199	683,100	239,099	
United States	190,328,989	150,306,625	40,022,364	197,740,982	149,094,035	48,646,947	

Table 9—State rankings for met farm income: total, per farming operation, and per acre, 1992

Rank	Total		Per operat	ion	Per ecre	
	State	Value	State	Value	State	Value
		1,000 dollars		Dollars		Dollars
1	California	4,756,253	Arizona	74,346	Rhode Island	568
2	Texas	3,464,003	Florida	71,192	Connecticut	6.63
3	Florida	2,776,492	California	59,453	Massachusetts	294
4	Nebraska	2,692,379	Rhode Island	51,106	Florida	264
5	Iowa	2,464,648	Delaware	50,135	North Carolina	250
6	North Carolina	2,452,864	Nebraska	48,078	Delaware	242
7	Kansas	1,722,641	Connecticut	47,480	New Jersey	242
8	Illinois	1,695,821	Idaho	44,724	Maryland	176
9	Georgia	1,680,602	North Carolina	40,881	California	160
10	Minnesota	1,480,461	South Dakota	39,842	Georgia	139
11	Arkansas	1,404,897	Colorado	37,134	Alabama	116
12	South Dakota	1,394,470	Georgia	36,535		104
13	Washington	1,336,672	New Mexico		Pennsylvania Maine	97
4	Kentucky	1,307,088	Washington	36,397		96
15	Ohio	1,213,946	North Dakota	36,126 33,067	New Hampshire Kentucky	93
					Reflectory	
16	Alabama	1,141,349	Arkansas	30,541	Arkansas	91
17	North Dakota	1,091,215	Massachusetts	29,003	Vermont	53
8	Oklahoma	1,082,857	Wyoming	25,989	Washington	24
9	Colorado	946,929	Kansas	25,711	Ohio	79
20	Idaho	939,196	New Jersey	25,004	Mew York	76
21	Missouri	874,834	Maryland	24,883	Iowa	74
22	Pennsylvania	832,044	Alabama	24,812	Virginia	72
23	Wisconsin	811,261	Iowa	24,163	Idaho	70
4	Indiana	729,336	Nevada	22,542	South Carolina	65
25	Oregon	695,943	Utah	21,319	Illinois	60
26	Mississippi	673,697	Illinois	20,973	Nebraska	57
27	Virginia	627,061	Maine	19,371	Louisiana	56
28	Man York	622,258	Vermont	19,240	Michigan	54
9	Tennessee	608,303	Texas	18,929	Mississippi	53
30	Arizona	594,771	Montana	18,799	Minnesota	50
31	Michigan	580,658	Oregon	18,558	Tennessee	48
32	Man Mexico	491,354	Mississippi	17,729	Wisconsin	47
3	Louisiana	490,681	Minnesota	16,823	Indiana	46
4	Montana		York			40
5	Maryland	462,452 388,170	Louisiana	16,375 16,356	Oregon Kansas	36
						-
36	South Carolina	338,373	Pennsylvania	16,001	Oklahoma	32
7	Utah	281,405	Ohio	15,563	South Dakota	32
8	Wyoming	239,099	New Hampshire	15,492	Missouri	29
9	Jersey	212,531	Oklahoma	15,252	Colorado	29
0	Massachusetts	200,121	Kentucky	14,364	North Dakota	27
1	Connecticut	189,918	Virginia	14,251	Texas	27
2	Maine	137,536	South Carolina	13,811	Utah	25
3	Delaware	135,365	Indiana	11,221	West Virginia	21
4	Vermont	132,753	Alaska	11,085	Arizona	17
5	West Virginia	79,043	Michigan	10,753	Hawaii	16
6	Nevada	56,354	Wisconsin	10,269	Mem Mexico	11
7	New Hampshire	44,926	Missouri	8,176	Montana	8
8	Rhode Island	35,774	Tennessee	6,913	Wyoming	7
9	Hawaii	27,157	Hawaii	6,035	Nevada	6
0	Alaska	5,986	West Virginia	3,952	Alaska	۵
	United Ctates		United Chates	27 277	United Ctates	50
	United States	48,646,947	United States	23,233	United States	50

Table 10-Farm marketings, 1991 and 1992, Government payments, 1992 and principal commodities, 1992, by State

			1004					
State		m marketings,			m marketings,		1992 Government	State rank for total farm marketings, four prin- cipal commodities in order of marketing receipts,
	Total	Crops	Livestock and products	Total	Crops	Livestock and products	payments	and percentage
				1,000 dollars				
Alabama Alaska Arizona Arkansas California	3,006,747 26,559 1,867,235 4,241,502 17,776,785	769,639 20,173 1,081,013 1,577,632 12,522,600	2,237,108 6,386 786,222 2,663,870 5,254,185	2,830,062 25,478 1,835,250 4,602,230 18,234,014	767, 311 19,631 1,900,501 13,179,284	2, 062, 559 5, 847 892, 463 5, 701, 729 5, 054, 730	119, 132 75,580 410,026 430,382	25-Broilers, cattle, greenhouse, peanuts, (72%) 50-Greenhouse, dairy prod, potatoes, hay (81%) 32-Cattle, cotton, dairy prod, hay (65%) 11-Broilers, soybeans, rice, cotton (68%) 1-Dairy prod, greenhouse, grapes, cattle (41%)
Colorado Connecticut Delaware Florida Georgia	3,762,245 472,178 621,954 6,124,957 3,933,768	1,098,989 263,957 183,784 4,953,331 1,772,025	663 208 438 171 161	main tin	1,083,185 249,113 184,436 1,763,842	239, 451, 159,	324 324 324 324 324 324 324 324 324 324	17-Cattle, term, wheat, dairy prod, (80%) 44-Greenhouse, dairy prod, eggs, tobacco (67%) 40-Broilers, soybeans, corn, greenhouse (81%) 8-Oranges, greenhouse, tomatoes, sugar (55%) 16-Boilers, peanuts, cattle, eggs (58%)
Hawaii Idaho Illinois Indiana Iowa	2,651,430 7,534,410 4,500,353 10,249,590	474,272 1,586,238 5,181,365 2,583,245 4,529,154	87,601 2,353,045 1,917,108 5,720,436	564, 151 7, 815, 512 7, 633, 692 4, 505, 292 10, 329, 712	475,722 1,642,545 5,431,346 2,683,346 4,715,624	88,429 2,202,346 1,821,443 5,614,088	255 252 118 178	41-Sugar, pineapples, greenhouse, nuts (73%) 26-Cattle, potatoes, dairy prod, wheat (70%) 5-Corn, soybeans, hogs, cattle (86%) 12-corn, soybeans, hogs, cattle (74%) 3-Hogs, corn, cattle, soybeans (90%)
Kansas Kentucky Louisiana Maine Maryland	7,076,365 3,196,220 1,728,110 483,586 1,352,025	2,275,897 1,490,870 1,091,798 192,052 563,821	4,800,468 1,705,350 636,312 291,534 788,204	7,000,307 3,221,305 1,846,181 513,187 1,390,765	2,442,242 1,580,236 1,258,928 1,258,928 512,686 586,792	4,558,065 1,641,069 587,253 300,501 803,973	592, 145 72, 125 270, 835 10, 253 16, 067	ain 5%) decu
Massachusetts Michigan Minnesota Mississippi Missouri	485,376 3,209,894 7,378,091 2,383,299 3,910,867	356,021 3,785,219 1,107,762 1,642,464	129,355 3,287,675 3,592,524 1,275,537 2,268,403	491,234 7,082,069 2,601,966 4,123,300	356,298 3,459,720 3,459,768 1,246,850 1,934,931	1324,936 1,324,609 3,622,301 1,355,116 2,188,369	142,509 422,509 422,904 279,904 293,645	43-Greenhouse, cranberries, dairy prod, egg (70%) 20-Dairy prod, corn, greenhouse, cattle (54%) 6-Dairy prod, corn, soybeans, cattle (63%) 27-Cotton, broilers, soybeans, cattle (72%) 15-Cattle, soybeans, hogs, corn (63%)
Montana Nebraska Nevada New Hampshire	1,514,382 9,044,459 296,946 142,474 658,186	3,111,126 88,220 79,135 465,203	809,971 5,933,333 208,726 63,339 192,983	1,742,408 8,782,653 272,795 143,983 656,888	3, 109, 062 71, 147 78, 975 464, 505	5,673,591 201,648 65,008 192,383	298,773 478,729 11,244 11,550 10,695	33.Cattle, wheat, barley, hay (87%) 4.Cattle, corn, hogs, soybeans (89%) 47.Cattle, dairy prod, hay, potatoes (89%) 48.Dairy prod, greenhouse, apples, hay, (67%) 39.Greenhouse, dairy prod, eggs, peaches (44%)
New Mexico New York North Carolina North Dakota Ohio	トロケロコ	474,405 1,081,117 2,338,602 1,876,863 2,483,541	977, 889 1, 792, 582 2, 617, 184 669, 689 1, 681, 316	1,530,425 2,946,039 5,181,017 3,093,612 4,167,316	490,324 1,031,986 2,386,168 2,338,761 2,587,323	1,040,101 1,914,053 2,794,849 754,851 1,579,993	60,267 47,872 74,805 443,156 166,122	cattle turke sunflor
Oklahoma Oregon Pennsylvania Rhode Island South Carolina	3,856,406 2,524,544 3,401,890 69,293 1,226,129	1,068,129 1,699,026 996,834 56,904 677,414	2,788,277 2,405,518 2,405,056 12,389 548,715	3,634,931 2,489,821 3,618,490 1,176,746	1,694,516 1,064,539 59,527 631,500	2,497,677 795,305 2,554,251 12,691 545,246	248,322 87,474 48,765 72,588	18-Cattle, wheat, greenhouse, broilers (80%) 28-Cattle, greenhouse, dairy prod, wheat (47%) 19-Dairy prod, cattle, greenhouse, mushrooms (68%) 49-Greenhouse, dairy prod, eggs, potatoes (72%) 36-Tobacco, broilers, cattle, soybern (45%)
South Dakota Tennessee Texas Utah Vermont	3,313,596 1,936,439 12,216,963 720,860 434,044	1,188,465 4,336,062 4,336,062 171,254 64,437	2, 125, 131 1, 043, 782 7, 880, 901 549, 606 369, 607	3,229,480 2,103,471 11,619,842 738,338 451,898	1,263,112 1,042,225 4,096,754 181,976 63,396	1,966,368 1,061,246 7,523,088 556,362 388,362	271,899 1,162,039 35,972 5,550	21-Cattle, wheat, hogs, corn (73%) 30-Cattle, dairy prod, cotton, tobacco (60%) 2-Cattle, cotton, dairy prod, greenhouse (69%) 38-Cattle, dairy prod, hay, turkeys (72%) 45-Dairy prod, cattle, greenhouse, hay (91%)
Virginia Washington West Virginia Wisconsin	2,115,662 4,143,238 323,901 5,416,533 836,923	2,844,292 2,844,292 1,225,460 1,68,850	1,362,977 1,298,946 2553,114 4,191,073 668,073	2,134,353 4,454,223 342,548 5,499,038 773,312	2,922,152 75,476 1,185,676	1,352,915 1,532,071 267,072 4,313,362 606,185	29,072 188,743 6,862 166,027	29-Cattle, broilers, dairy prod, tobacco (55%) 13-Apples, cattle, dairy prod, wheat (61%) 46-Cattle, broilers, dairy prod, turkeys (69%) 9-Dairy prod, cattle, corn, hogs (81%) 37-Cattle, sugar beets, hay, sheep (86%)
United States	168,721,475	81,941,767	86,779,708	171,168,411	84,810,447	86,357,964	9,168,920	Cattle, dairy prod, corn, soybean (49%)

Production expenses display the arm regional patterns of per acre and per operation levels associated with net farm income. The rankings of net farm income and production expenses on a per-acre basis are nearly identical. Among the top 10 States, 9 States are the same in both rankings. This is consistent with economic theory that, at the margin, the rate of return for a factor of production must be the arm or else the factor of production will find alternative employment in the production of another commodity.

In per operation rankings, the composition of the top 10 States for net farm income and production expenses had less consistency than the rankings computed on both the

aggregate and per acre basis. In expenses per operation, Colorado, Hawaii, Kansas, Washington, and Iowa were among the top 10 States but were outside the group in net farm income per operation. In net farm income per acre, Florida, Rhode Island, Connecticut, North Carolina, and South Dakota were among the top 10 but were outside the in expenses per acre. The achievement of a high per operation ranking tends to reflect the effects of two attributes: the size of operation, which is often large in the cattle producing States, and high per acre value of production, common to the production of fruit and commodities produced in structures, particularly poultry and greenhouse/nursery products.

New Estimation Procedures for Farm Income Accounts

In May, Agricultural Income and Finance announced that new procedures would be coming for estimating farm sector expenses, farm-related income, and some of the noncash income components in the national farm sector income accounts.

USDA's annual Farm Costs and Returns Survey (FCRS) is now being used directly for these estimates for 1991 and 1992, and historical accounts have been revised back to 1988. The FCRS was not directly used previously for several reasons. A shortcoming was that the FCRS estimates of farm numbers, land in farms, and acreage and production of major crops were less than the official estimates published by USDA's National Agricultural Statistics Service (NASS).

NASS and ERS staff have been working since 1990 to develop and implement adjustment procedures for expanding FCRS data to provide more complete coverage of all U.S. farms. These new procedures have changed aggregate U.S. totals for farm production expenses, income, and other economic data. The new procedures were adopted for the just-completed survey of the 1992 calendar year. Data for 1991 were resummarized and previously published estimates for 1988 to 1990 were adjusted to provide a historical perspective.

Adjusting Survey Indications for Nonresponse by Farm Operators

Previously, the use of the FCRS in the farm income sector accounts has been limited to indications of direction and magnitude of change for components of farm related income and production expenses. This was due to the fact that after expansion of the sample, the number of small farms with less than \$20,00 in gross sales represented by the FCRS has typically been below the official USDA estimate of farm numbers (as estimated and published by the National Agricultural Statistics Service (NASS)). NASS has modified both sampling, estimation, and expansion techniques to provide complete farm coverage. The results are now deemed to be adequate to be incorporated directly into the sector accounts.

Since the survey did not represent the entire population of producing operations due to problems with both undercoverage and nonrespondents, ERS had previously considered it inappropriate to use the FCRS solely in setting components of the income accounts. In establishing levels, ERS had benchmarked its production expenses in the farm sector income accounts to the Agricultural Census statistics, collected every 5 years. In intercensus years, ERS relied on the FCRS for indications of magnitude and direction of changes in expenses in order to move the statistics established in Census years.

This all changed in 1993. Utilizing improved statistical methodology, NASS began to produce, from the annual Farm Costs and Returns Survey, estimates of production expenses incurred by farm operators that are representative of all operations in the farm sector. NASS publishes the production expenses collected on the survey annually, and initiated its "sector wide" estimates (for 48 States) in the most recent report Farm Production Expenditures, 1992 Summary (Sept. 1993), which also included revisions for 1988-91.

Correspondingly, within this publication, many components of production expenses and "other farm-related income" are, for the first time, based directly on the improved FCRS results. Revisions are included for all years since the last Agricultural Census (1987). For corresponding expense items, the sector expenses are consistent with, but not necessarily identical to, those published by NASS.

Differences between ERS and NASS estimates exist for two reasons. One, the survey is directed at only the 48 contiguous States; thus, Alaska and Hawaii estimated separately and then added to the 48-State statistics in ERS' national accounts. Second, some components are adjusted

for conceptual differences. Because the survey is directed more to farm operators, opposed to the farm sector, the FCRS statistics may be only one component of the line item in the sector account. In many cases, the sector accounts incorporate landlord expenses, which are in addition to operator expenses. The operators' component would be the same as that published by NASS directly from the survey, for example, interest expenses.

The 1991 and 1992 versions of the ERS and NASS published statistics for comparable expenses are consistent, but the revisions for 1991 are not the same. The explanation is that ERS has historically incorporated adjustments in its estimates to compensate for the perceived downward bias resulting from undercoverage in the FCRS. As a result, the revisions in the income accounts are limited mostly to adjustments for nonrespondents, plus some additional fine-tuning for the undercoverage adjustments.

Though not published by NASS, a similar situation existed in the ERS income accounts regarding the data sources and estimation methods for the components of "other farm-related income," with the exception of forest products, which are not from the FCRS. The income components are now based on the FCRS and the points discussed above regarding expenses are equally applicable.

Rancons for Change

In research completed in October 1992, NASS concluded that the operational method of adjusting for nonresponse the list side yielded results that were biased downward because too much weight was given to screen-outs (contacts that did not meet the definition of a farm). Although problems in adjusting for nonresponse were suspected, no previously completed research supported these claims.

Effects of New Procedures on Components of Net Farm Income

USDA's Farm Costs and Returns Survey (FCRS) is now used directly to estimate many farm income components. The effects of this improved procedure can be examined by comparing last year's estimates of 1991 farm income with resummarized 1991 estimates. Gross farm income increased only 0.4 percent. Most of the change occurred with production expenses, which were revised up by 3.6 percent. This resulted in 11.5-percent decrease in 1991 net farm income.

Gross Farm Income

* Cash receipts No effect;

Based on prices, quantities, and marketing patterns; At State level from NASS' national survey programs.

* Government programs No effect;

Based ASCS' administrative records.

Other farm-related income

Affects several components:

Machine hire and custom work; Custom livestock feeding;

Miscellaneous (recreation income, co-op dividends, etc.)

* Non-money income Affects:

Value of home consumption of crops

Imputed rental value of dwellings (indirectly through estimates of

dwelling values).

Production Expenses

* Cash expenses FCRS is source of most components for the 48 States;

Alaska and Hawaii must be estimated separately and added to other U.S.;

Some components are adjusted for differences in concepts.

Non-cash expenses Perquisites for hired labor based on FCRS;

Depreciation: indirect effect since capital expenditures subject to depreciation

are based on the FCRS.

Net Farm Income Computed as the residual after deducting production expenses from gross

farm income.

NASS has always adjusted for nonrespondents (refusals and inaccessibles) in the FCRS. In the past, the list sample nonresponse was adjusted if these nonrespondents represented the general population, for example, farm and nonfarm screenouts. Beginning in 1992, the 1991 FCRS summary was revised using a new nonresponse adjustment procedure where all nonrespondents were treated as positive reports or farms. The man nonresponse adjustment increased 1991 data expansions by about 3 percent on the average. This represents the magnitude of error on the 1991 list expansion prior to adopting the new adjustment procedure.

In a parallel effort, also beginning in the fall of 1992, NASS resummarized the 1991 FCRS with an adjustment for farm undercoverage based on USDA's official number of farms. The undercoverage adjustment increased 1991 data expansions by nearly 6 percent at the U.S. level for total expenditures. The adjustments were made within six sales classes, by region.

The two smallest sales classes were affected the most by the resulting changes in cash expenses from the resummarized 1991 FCRS, with the majority of the difference being attributable to improved methods designed to account for undercoverage. Farms with sales of less than \$40,000 accounted for 24 percent of the total increase in expenses and 67 percent of the total increase in the number of farms. These farms do not account for much of total U.S. agricultural production. Thus, it is not surprising that the increased number of farms in this sales class has a relatively small impact on total expenses.

Getting from Sector Income to Household Income

USDA publishes two major income measures, sector net income and average household income. Household income is a logical extension of the sector accounts after the sector's components are identified.

The average farm income per operator household is reported by USDA to be \$4,397 for the 1991 calendar year based on its annual Farm Costs and Returns Survey (see appendix table 2). USDA also reports aggregate farm sector net cash income to be \$53.3 billion in 1991 (see appendix table 1). The May 1993 issue of Agricultural Income and Finance showed conceptually how the estimate of average farm income per operator household (in thousands of dollars) could be derived from the reported aggregate estimate of net cash income for the sector (in billions of dollars). This supplement provides data to show how the farm sector net cash income is distributed among farmers and other people and businesses who provide production inputs.

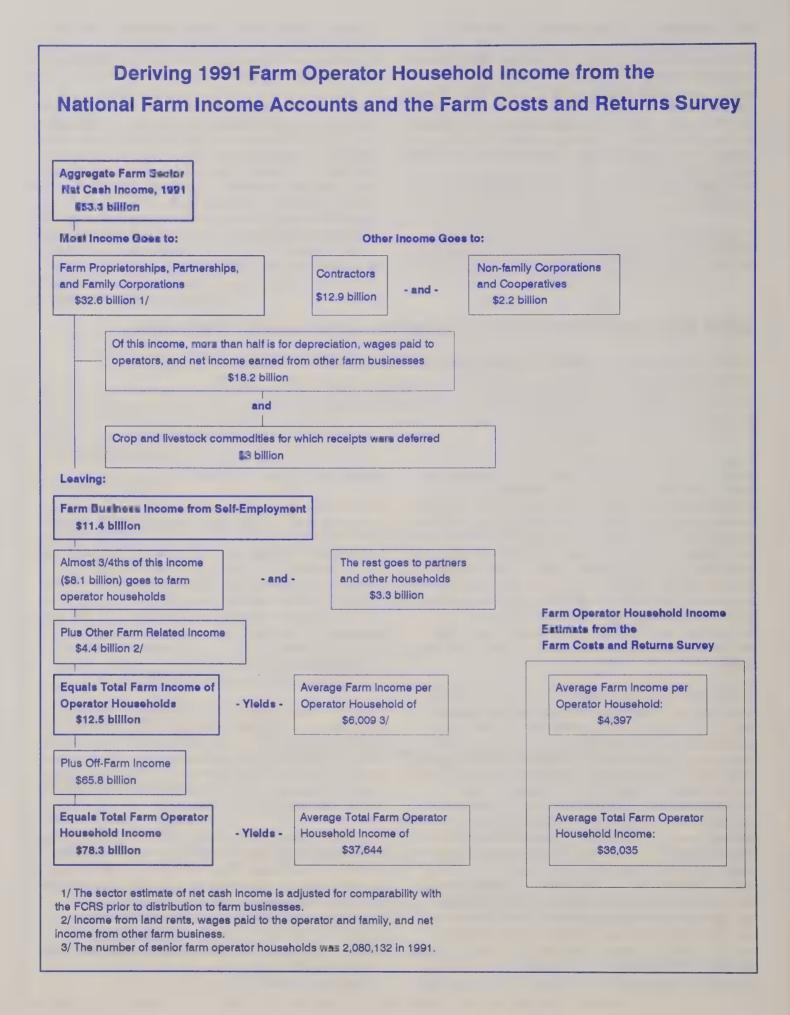
A variety of people and businesses, both farm and nonfarm, provide the management, machinery and equipment, land, labor, financing, and operating inputs used to produce the Nation's crop and livestock products each year. Some inputs, such as fertilizer, chemicals, labor, financing, leased land, and equipment provided in exchange for cash payment or a share of the production. These items are part of farmers' operating expenses and providers do not share in the net income of the farm business (nor of the farm sector). Farming arrangements exist, however, where operators and other persons or businesses share both in the acquisition of production inputs and in the value of crop or livestock commodities produced by the farm operation. These arrangements include partnerships or contractual agreements where the contractor retains ownership of the commodity being raised (hogs, broilers, vegetables, etc.), provides most inputs (feed, seed, etc.), removes the commodity from the farm for further processing or sale, and pays the operator a fee (or a share of the commodities'

total sale value) to cover the costs of labor, management, capital, and other services provided.

Such organizational arrangements have existed on farms for a long time. In 1986, USDA changed how it reported net income to reflect income earned per farm operation opposed to income per farm. This change recognized that the net income of the farm business can be shared by the operator and other persons, households, or businesses. Traditionally, net income was viewed going to farm operators and it was generally assumed that each farm had one operator. The data have been collected to correctly distribute the net income of farm businesses among different providers of resources and to correctly measure the share of net income going to farm operator households.

The flow chart (first published in the May 1993 issue of Agricultural Income and Finance) provides an estimate of average farm income per operator household derived from USDA's aggregate sector income accounts. This estimate of \$6,009 per farm is equivalent to the \$4,397 in farm income per operator household that is derived from USDA's Farm Costs and Returns Survey.

To arrive at an estimate of income of farm operator households from the aggregate sector estimates, it is necessary to measure the amount of income that is included in the aggregate farm sector estimates but excluded from farm surveys. An estimated \$5.6 billion is included in USDA's sector estimate, but not its surveys (the sector estimates include \$1.8 billion for forestry sales, \$0.1 billion for Alaska and Hawaii, \$0.2 billion for institutional farms, \$1.4 billion for egg producers, and \$1.7 billion for CCC loan repayment premiums).



Conceptually, both sources should account for the remaining \$47.7 billion in net cash income. This income is distributed among farm proprietorships, partnerships, family corporations, and farms recognized by USDA nonhousehold farms (contractors and nonfamily corporations and cooperatives). Contractors earned nearly \$13.0 billion of the sector's net income in 1991. This result should not be too surprising when it is recognized that nearly 38,000 farms had livestock production contracts and another 10,000 had crop production contracts. The majority of the net income earned by contractors is for poultry, cattle, hogs, and vegetables, the most common commodities produced under a contract arrangement.

USDA's estimate of net income earned by farm proprietors, partnerships, and family corporations is converted first to an estimate of farm business income from self-employment and, ultimately, to mestimate of farm income of operator households. This conversion requires deductions for charges for machinery, equipment, and other long-lived assets used in production, as well as to account for the ownership of multiple farming operations and wages that operators pay themselves for work done on the farm. These adjustments are made so that USDA's estimates of net farm income can be converted to a measure of self-employment income comparable to that reported for other U.S. businesses. Net income earned on other farms and cash wages paid to the operator are deducted when developing the business estimate of self-employment income. This income is added back when developing the household estimate of income because households receive all of these earnings; they are not shared with partners or shareholders.

USDA estimates that nearly 200,000 partners and other households share in the self-employment income generated by farm businesses, in addition to the nearly 2.1 million senior farm operator households. Altogether, 2.3 million households share in the self-employment net income generated by the Nation's 2.1 million farms, or approximately 1.1 households per farm. Farms which share income among multiple households average 2.5 households per farm. In addition, more than 600,000 share rent landlords, and nearly 20,000 non-farm corporations and cooperatives also receive a share of the farm sector's net income. An unknown number of contributors also hold agreements with nearly 48,000 farms to produce commodities under some fee arrangement and, as shown in the flow chart,

Deriving an estimate of farm income of operator households consistent with the money income earned by other U.S. households highlights the need to understand the variety of production arrangements that exist in U.S. agriculture since they can affect the distribution of income among farmers and other participants in the agricultural production process. Arriving at an estimate of total farm operator household income from all sources comparable to that of other U.S. households also highlights the role that off-farm income plays in the total income available to farm families for consumption, saving, and investment in their farm and nonfarm pursuits. That off-farm sources of income account for nearly 85 percent of the total farm operator household income, an average, illustrates the importance of general economic conditions to farm families.

Comparing USDA and IRS Farm Income Statistics

Both the Internal Revenue Service (IRS) and the U.S. Department of Agriculture (USDA) report statistics on the net incomes earned by farmers and farm businesses. Statistics reported by these two Federal agencies have been used interchangeably without consideration for major conceptual and empirical differences. This supplement explains the differences in IRS and USDA statistics. Included is a note, prepared by the General Accounting Office (GAO), which highlights results of their investigation into the differences.

None of USDA's farm income measures represent a aggregation of taxable income for farmers or any subgroup, such an individual proprietors. On occasion, confusion arises when readers attempt to compare USDA's farm income series with statistics from the IRS. IRS' series is aggregated from Schedule F: Profits and Losses from Farming. This tax form has the only tax data that can definitely be classified as originating from farms.

Comparing the IRS statistics to USDA's net farm income statistics is difficult. IRS does not take into account some farm income reported on tax schedules that do not identify

the income as related to farming. In addition, populations of individuals and firms sampled by the IRS and USDA are different, and even the concepts of income and costs are different.

For example, the USDA's net farm income is designed to be conceptually consistent with the Department of Commerce's (DOC) Gross Domestic Product (GDP) and provides DOC a source for the farm sector's contribution to GDP. It includes net income from the total production of all agricultural commodities and related services originating from any establishment meeting the USDA definition

of a farm, regardless of its legal form of ownership or organization.

In contrast, much of the agricultural sector's production does not get reported on Schedule F. Examples are sales that can be classified on capital assets and taxed as capital gains, particularly breeding stock and forestry, and the billions of dollars of production owned by large integrated firms that process and market produce. USDA's 1989 net farm income included \$1.5-\$2 billion in net value of production for goods and services consumed on the farm where produced but never sold. These do not get reported on Schedule F because two-party market transactions do not establish value. Two examples are the imputed net rent for operator dwellings (\$1.26 billion) and home consumption. Home consumption of commodities must be less than the \$592 million of gross value, since these expenses cannot be separated from the other farm expenses.

The IRS has found substantial underreporting of net income for purposes of determining tax liabilities across all industries, including farming, in its research of income measures for small firms. Without a thorough evaluation of the IRS data on tax compliance, it is difficult to determine the amounts of income involved.

USDA and IRS income statistics also differ in that several hundred thousand individuals, not classified as farmers by USDA, file tax returns using the farm Schedule F. For USDA to classify an operation as a farm, it must have (or normally would have) farm product sales valued at \$1,000 or more. This classification defines the population of participants who are officially in the farm sector, and is a parameter in data collection activities conducted by both USDA and the Census of Agriculture. Individuals not classified as farmers by USDA do, however, report farm returns to the IRS, and these individual tax return filers report an average loss of several thousand dollars each on their Schedule F forms.

A recent Government Accounting Office (GAO) report supported the validity of the USDA's net farm income as a measure of the net value of production of goods and services produced by the U.S. farm sector. The report identifies the conceptual and empirical differences between the USDA's net farm income, representing value added by the factors of production controlled by farm operations, and IRS' summation of Schedule F's filed only by individuals, who independently decide which forms to employ in reporting their taxable incomes (See box).

WHY IRS' AND USDA'S NET FARM INCOME FIGURES DIFFER

A letter to Agricultural Income and Finance Situation and Outlook from Dennis Parker, Senior Evaluator in GAO's Resources, Community, and Economic Development Division and assignment manager for NET FARM INCOME: Primary Explanations for the Difference Between IRS and USDA Figures:

For years, IRS and USDA have been reporting estimates of net farm income, with USDA's figures being higher than IRS'. During the most recent 20-year period, the differences between the two net farm income figures have increased substantially, from \$11 billion in 1970 to almost \$46 billion in 1989. These differences have led some farmers and farm groups to express concern about the figures.

Why do IRS' and USDA's net farm income figures differ? This is the question the U.S. General Accounting Office (GAO) set out to answer for Senator J. Robert Kerrey. GAO's efforts culminated in a report that identified what the agency believed to be the primary explanations for the difference between the two figures. These explanations are:

- THE IRS AND USDA UNIVERSES ARE NOT COMPA-RABLE. IRS' net farm income figures for 1989 (the most recent year for which data were available) were derived from data collected from 2.5 million farm tax filers, including those with farm receipts of less than \$1,000. In contrast, USDA's figures for 1989 represented data collected from 2.2 million farms from which \$1,000 or more of agricultural products either were sold or would normally have been sold during the year. Also, while IRS excludes farm incomes and expenses from corporations that classify themselves as something other than agricultural producers, USDA includes all farmrelated incomes and expenses from corporations, regardless of how the corporations are classified. This issue is important because, according to USDA, net farm income derived from contractual arrangements between corporations and farmers amounted to \$11.3 billion in 1989. To the extent that income resulting from these arrangements was received by corporations not classified as agricultural producers, it would have been excluded from IRS' net farm income figures.
- USDA's FIGURES INCLUDE NONCASH ITEMS THAT IRS EXCLUDES. USDA's net farm income figures include noncash items not included by IRS. These non-

cash items consist of (1) the value of farm products consumed on the farm as food, (2) an imputed income for the rental value of the farm dwellings of operators and hired laborers, and (3) the value of changes in livestock and crop inventories during the year. USDA justifies including these items on the basis that its figures represent the net value of all goods and services produced on a farm. In 1989, the net value of these items constituted more than \$7 billion of USDA's net farm income figure.

- IRS AND USDA TREAT SOME SALES OF LIVESTOCK DIFFERENTLY. While USDA includes all proceeds from the sales of livestock in its net farm income figures, IRS does so only if the livestock are held mainly to be sold. For sales of livestock held for breeding, sport, or dairy purposes, IRS includes the proceeds as sales of business property, thereby excluding them from IRS' net farm income figures. In 1989, it was estimated that \$3 billion in net farm income from livestock sales were included in USDA's figures but not in IRS'.
- IRS AND USDA ACCOUNT FOR DEPRECIATION DIFFERENTLY. In computing depreciation, USDA measures the economic life and the contribution of the farm-related assets to production while IRS follows definite tax rules that do not necessarily replicate the economic concept. As a result of this and other computation differences, USDA's net farm income figure for 1989 included a deduction for depreciation of \$17.2 billion while IRS used a projected figure of \$20.4 billion.
- IRS REPORTS THAT TAX FILERS UNDERSTATE NET FARM INCOME. As a result of the misreporting of tax items, IRS concludes that its yearly net farm income figures, like its other income accounts, are understated. For 1989, IRS projected that its net farm income would be understated by about \$11.7 billion.

In its report, GAO also pointed out that caution must be exercised when using IRS' and USDA's net farm income figures. Such caution is necessary, say GAO, because some groups of farmers (categorized by size of adjusted gross income or by sales class) are profitable while others are not. Consequently, dependence on any one figure to describe farmers' well-being could present a misleading picture of the financial conditions of different groups within the farm sector.

Financial Characteristics of U.S. and Canadian Farms, 1991

by Charles H. Barnard 1

Abstract: The financial characteristics of U.S. and Canadian farms exhibited clearly distinguishable patterns in 1991. On a per farm basis, U.S. and Canadian farms were most similar in terms of that asset value and operator family income. Differences were greatest in terms of debt, direct government payments, and source of family income. Many of the relationships observable in national level that are so consistent in a they transcend type and size categories. Poultry, and to a lesser extent hogs, were the least similar; grain farms were the most similar.

Keywords: financial characteristics, Canada, United States, assets, debt, family income, farm income.

This report compares the financial characteristics of U.S. and Canadian farms they existed in 1991. A careful examination of differences in farm financial characteristics between the United States and Canada is especially significant given the recent establishment of the Canada/U.S. Free Trade Agreement and the impending decisions on the North American Free Trade Agreement (NAFTA). Comparative financial information for U.S. and Canadian farms provides useful information both for gauging the more immediate impacts of agricultural trade liberalization and for anticipating longer term changes in general farm structure.

A significant contribution of this study is its achievement of high degree of comparability between the Canadian and U.S. datasets, thus minimizing the possibility of spurious results due to incompatible data. Available published data are not strictly suitable for the comparison conducted in this study because differences in concepts, definitions, and data collection procedures cannot be adequately adjusted from such sources. This study makes adjustments to original, farm-level data, removing the major conceptual differences from two existing surveys of financial characteristics.

Section one of this report describes the Canadian and U.S. surveys and the methods used to generate comparable farm balance sheet and income statement items. The next section compares similarities and differences between Canadian and U.S. farm financial characteristics in 1991. The discussion relates to farm financial structure as estimated for national data, and also for types and sizes of farms. In addition, special attributes of the poultry subsector are discussed, which are important to the understanding and interpretation of the financial comparison.

U.S./Canadian Delabares

The comparison of financial structure was constructed from two national surveys of farm financial conditions: the U.S. Farm Costs and Returns Survey (FCRS) and the Farm Financial Survey (FFS) in Canada. The most recent year for which data from both surveys are available is 1991. In both countries, the respective surveys are the principal national-level sources for farm financial information. The FCRS is m annual survey designed to collect U.S. economic data related to farm expenses, receipts, assets, and liabilities. Farm balance sheets and income statements constructed from the survey are used to assess farm financial conditions at the regional and national levels. In addition, the survey is used to collect information necessary to construct cost-of-production budgets for several commodities. For 1991, 12,250 observations were available from which to construct national estimates.

The Canadian FFS has been conducted every 2 or 3 years since 1980 to collect national and regional farm financial data. For 1991, 8,338 observations were usable to generate estimates at the national and provincial levels.

Differences between U.S. and Canadian farm accounting concepts and survey methods and procedures made data adjustments necessary in order to achieve an acceptable level of standardization. Among the adjustments undertaken were those necessary to standardize farm definitions, expense definitions, classification of farm types, treatment of nonrecourse loans, and definitions of family income (see box). The U.S. database, generally, was adjusted to fit Canadian definitions. The U.S. data are collected in much disaggregated form, thus making the necessary adjustments possible. Canadian dollars were converted to U.S. dollars and the analysis was conducted on a per farm basis.

In addition to the aggregate comparison of all farms, six types and four size categories of farms were examined. Farms were classified into types according to the major

and Rural Economy Division.

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Adjustments to U.S. Data

The family income figures reported here are not comparable to USDA's official estimates of farm family income (see appendix tables 1 and 2). Instead, the family income figures reported here were adjusted to achieve comparability with Canadian data. Adjustments to U.S. farm family income data that cause the figures reported here to differ from USDA's official reported estimates are: 1) farms with sales of more than \$1,000 but less than \$1,735 (\$2,000 CDN) are excluded, 2) nonrecourse loans from the Commodity Credit Corporation (CCC) are treated as balance sheet items rather than as current year income, and 3) the depreciation allowance has not been subtracted from net cash farm income. In addition, "net farm income from another farm business" is classified as offfarm income rather than s farm-related income.

commodity produced: grain, dairy, beef, hog, or poultry if they derived at least 50 percent of gross farm revenue from those respective enterprises. The size categories examined are those containing farms that generated gross revenues of 1) less than \$43,638; 2) \$43,638 to \$87,274; 3) \$87,275 to \$218,187; and 4) \$218,188 or more. The corresponding categories in Canadian dollars 1) less than \$50,000 CDN, 2) \$50,000 CDN to \$99,999 CDN, 3) \$100,000 CDN to \$249,000 CDN, and 4) \$250,000 CDN or greater.

U.S./Canadian Financial Comparisons

The comparison examines relationships between U.S. and Canadian farm asset values, debt, profitability, direct program payments, and family income. Each of these characteristics of farm financial structure exhibit clearly distinguishable patterns in the two countries. Some of the patterns indicate similarities, while others indicate structural differences that have arisen a result of alternative farm economies and government policies.

Many of the relationships observable in the national-level data are so strong and so consistent that they generalize to most farm types and sizes. Poultry and hog farms, though, provide exception to the general relationships discussed. But, the dramatic differences measured for poultry farms in Canada versus those in the United States must be interpreted with caution. Discussion later in this report details how the prevalence of production contracting in the U.S. poultry subsector, and its contrasting limited presence in the Canadian poultry subsector, hinder intercountry comparisons. In terms of farm size, the largest farms most often provide exceptions to the general relationships discussed.

Balance sheets

In many respects, the 1991 balance sheets for Canadian and U.S. farms were similar. The average total asset val-

of U.S. and Canadian farms were essentially equivalent (near \$440,000) (table A-1). Average asset values for grain, dairy, beef and "other" farms, and for all size categories, were similar to their counterpart farm categories, differing by less than 18 percent. Excluding the value of quota, average asset values were larger for U.S. farms in every size and type category, except poultry and hog farms, which were substantially larger in Canada.

U.S. poultry farms had average total asset values of \$458,179, while Canadian farms had \$835,557. Quota is a particularly large item in the balance sheet of Canadian poultry farms, accounting for \$242,907 or 29 percent of total assets. ²

U.S. hog farms had average asset values of \$308,137, while Canadian hog farms had assets of \$515,245. The majority of difference in total assets between the two countries arises because Canadian hog farms had a much greater investment in land and buildings than did U.S. hog farms.

U.S. and Canadian farms have other differences that quite robust, applying consistently to most types and sizes of farms. For instance, the composition of assets displays interesting differences. Canadian farms or more heavily invested (in percentage terms) in intermediate-term assets, while U.S. farms have higher investment (in percentage terms) in land and buildings. The average level of debt an early 50 percent higher in Canada (\$80,327 versus \$54,151), yielding 50-percent higher debt-to-asset ratio in Canada (.18 versus .12) (table A-1). Average levels of debt and average debt/asset ratios were consistently higher for all types and sizes of Canadian farms.

Profitability

In 1991, Canadian farms generated substantially higher levels of average net cash farm income (before family wages and depreciation), \$25,022 (table A-2). This compares with \$14,205 per U.S. farm. The average net cash farm income was higher in Canada for each type and size of farm, except for the category with sales over \$218,188. Differences between the two countries were largest for poultry, hog, and dairy farms.

An estimated rate of return to farming for Canadian farms in 1991 is 7.3 percent, compared to the U.S. rate of 4.6 percent (table A-2). Canadian farms had a higher rate of

² Quotas are artificial production restrictions created and enforced supply management tools. Because quotas, by definition, are the limiting resource and because they are fixed in supply, any returns generated solely by the supply management program are capitalized, a least partially. As a consequence, ownership of quota (production rights) takes a tangible, marketable value.

³ This is probably attributable to ■ larger average size for U.S. farms in this largest category.

⁴ A nonstandard measure, labeled a rate of return to farming, measures profitability and was calculated by dividing a cash farm income (before family wages, depreciation and interest expenses) by total assets.

return to farming for all types and sizes of farms. In both countries, poultry farms had the highest rate of return (12.1 percent in Canada and 9.4 percent in the United States).

Government Payments

Government involvement and monetary contributions to the farm sector take a variety of forms. The most visible and easily measured is direct program payments to farm operators. Both the FCRS and the FFS collect information on direct program payments, but neither survey collects specific information in indirect program assistance. These indirect payments which take the form of price supports, interest subsidies, government purchase of commodities, cost sharing, technical advice, etc., would be reflected in (commingled with) market revenue or operating expenses. Consequently, the results presented for direct program payments should not be extrapolated to represent all of the programs and payments that impact in farm incomes.

Canadian farms of all types and sizes reported average direct program payments that were higher than those reported for U.S. farms (table A-3). In 1991, direct program payments for Canadian farms averaged \$8,323 compared to \$3,865 for U.S. farms. Though slightly higher in the Canada, the average amounts of direct program payments were roughly equivalent for U.S and Canadian grain farms in 1991.

The relative importance of direct program payments to farm revenue also was greater in Canada, for all categories. Direct program payments contributed 8.8 percent of Canadian farm revenue, compared to 4.7 percent in the United States (table A-3). The difference in this ratio was greatest for farms specializing in hogs (7.9 percent vs 2.3 percent) or dairy (9.2 percent vs 1.1 percent). In both countries, direct program payments as a percent of total revenue were highest for grain farms, at 14.1 percent in Canada and 11.2 percent in the United States.

In both the United States and Canada, direct program payments tend to become a smaller percent of total revenue as farm size increases, declining from 11.6 percent for the smallest farms in Canada to 6 percent for the largest. In the United States, the percent of direct program payments declined from 8.8 percent for the smallest category of farms to 3 percent for the largest category.

Family Income

Despite differences in size and organization, differences in the total family incomes of U.S. and Canadian farms

Table A-1—Assets, liabilities, and debt-to-asset ratios for Canada and the United States, 1991

	Canada	United States
	U.S.	Dollars
Assets:		
All farms	441,330	438,301
Type of farm		
Grain	412,958	444,937
Dairy	650,493	570,933
Beef	382,797	397,393
Hog	515,245	308,137
Poultry	835,537	458,179
Other	392,243	459,262
Revenue class		
Less than \$43,638	230,311	254,928
\$43,638 to \$87,274	382,964	445,502
\$87,275 to \$218,187	612,915	640,514
\$218,188 and greater	1,287,057	1,568,918
Liabilities:		
All farms	80,327	54,151
Type of farm		
Grain	76,766	73,231
Dairy	146,500	100,970
Beef	50,324	31,591
Hog	134,164	64,594
Poultry	178, 984	77,529
Other	64,729	52,783
Revenue class		
Less than \$43,638	22,684	16,042
\$43,638 to \$87,274	65,072	53,544
\$87,275 to \$218,187	128,500	104,727
\$218,188 and greater	306,417	275,879
	Po	ercent
Debt to asset ratio:		
All farms	18	12
Type of farm		
Grain	19	16
Dairy	23	18
Beef	13	8
Hog	26	21
Poultry	21	17
Other	17	11
Revenue class		
Less than \$43,638	10	6
\$43,638 to \$87,274	17	12
\$87,275 to \$218,187	21	16
\$218,188 and greater	24	18

Sources: Farm Financial Survey (Canada), Farm Costs and Returns Survey (United States)

relatively small. ⁶ In 1991, the average family income of U.S. farms was \$42,879 compared to \$37,598 in Canada (table A-4). Average family income was higher in the United States, except for dairy, hog, and poultry farms. The family incomes of poultry farm operators, in particular, are substantially higher in Canada. Family incomes of operators of hog farms are nearly identical in the two countries. The operators of the largest category of farms have substantially higher family incomes in the United States than in Canada.

The sources of family income are reversed in the United States and Canada. In terms of both dollars and percentages, Canadian farms receive more family income from farm sources, while incomes from nonfarm sources are larger and more important in the United States. This rela-

⁵ Note that the analysis relates to entire production. Thus, for a particular farm type, the program payments reported may be in regard to commodities other than the major commodity produced on the farm. Program payments reported for the average grain farm may include program payments on hogs well as on grain, and vice versa.

⁶ Principal operator's share for U.S. data; average over all operators involved in the operation for Canadian data.

Table A-2—Net cash farm income and rate of return on assets for Canada and the United States. 1991

	Canada	United States
	U.S. Dollars	
Net cash farm income:		
All farms	25,022	14,025
Type of farm		
Grain	22,671	18,721
Dairy	50,058	32,058
Beef	12,818	2,685
Hog	38,961	17,414
Poultry	83,517	34,736
Other	22.459	18,261
Revenue class		,
Less than \$43,638	2,512	-1,557
\$43,638 to \$87,274	19,833	10,260
\$87,275 to \$218,187	42,371	26,809
\$218,188 and greater	115,370	128,028
	Percent	
late of return on assets:		
All farms	7.26	4.58
Type of farm		
Grain	6.97	5.96
Dairy	9.90	7.44
Beef	4.52	1.52
Hog	9.87	7.72
Poultry	12.12	9.44
Other	7.15	5.30
Revenue class		
Less than \$43,638	1.84	0.07
\$43,638 to \$87,274	6.55	3.54
\$87,275 to \$218,187	8.84	5.96
\$218,188 and greater	11.11	10.10

Sources: Farm Financial Survey (Canada), Farm Costs and Returns Survey (United States)

tionship holds for all types of farms and for all sizes of farms, except those with sales over \$218,188. (For this latter group, U.S. farms earn more dollars of net cash farm income than the corresponding group in Canada, even though net cash farm income a percentage of family income remains higher in Canada.)

Nonfarm income made a major contribution to family income in both countries, but particularly in the United States. Average nonfarm income per family was \$16,572 in Canada and \$31,145 in the United States (table A-4), representing 44 percent and 73 percent of family income, respectively. In Canada, nonfarm sources accounted for less than 50 percent of family income for operators of every type of farm, except beef farms. In the United States, this was true only for dairy (33 percent), and poultry operations (48 percent). In both countries, smaller farms are much more dependent on nonfarm income than the very largest farms.

Production Contracting in the Poultry Subsector

The financial structures of poultry farms are quite different between the United States and Canada, stemming (at least in part) from differences in the prevalence of production contracting. Almost all U.S. poultry production is performed under some type of contract arrangement. Produc-

Table A-3—Direct program payments for Canada and the United States, 1991

	Canada	United States
	U.S. Dollars	
)irect program payments (DP	P):	
All farms	8,323	3,865
Type of farm		Ť
Grain	10,660	9,905
Dairy	13,911	1,707
Beef	3,785	1,862
Hog	15,053	2,145
Poultry	5,886	308
Other	4.023	3,008
Revenue class		
Less than \$43,638	1,979	1,110
\$43,638 to \$87,274	7,703	4,075
\$87,275 to \$218,187	14,121	8,392
\$218,188 and greater	29,532	17,792
		ent
mas mercent of total r		
All farms	8.8	4.7
Type of farm		
Grain	14.1	11.2
Dairy	9.2	1.1
Beef	5.7	4.4
Hog	7.9	2.3
Poultry	1.7	0.2
Other	4.1	3.0
Neverue class		
Less than \$43,638	11.6	8.8
\$43,638 to \$87,274	12.1	6.5
\$87,275 to \$218,187	10.4	6.1
\$218,188 and greater	6.0	3.0

Sources: Farm Financial Survey (Canada), Farm Costs and Returns Survey (United States)

tion contracts are less widespread in the Canadian poultry subsector.

Under typical U.S. production contracts, the farm operator (producer or contractee) provides land, buildings, labor, and some day-to-day management of the flock. The large, vertically-integrated, contractor/processor provides the chicks, feed, medicine, and overall management. The contractor retains ownership of the poultry throughout the production process. The contractee (producer) is compensated with a fee that covers labor and an implicit rental cost for the land and buildings.

Canadian poultry farms, on the other hand, generally own (or rent) their production assets, maintaining managerial control of the full set of inputs throughout the production process. Typically they own the birds, provide feed and other inputs, and also own the land and buildings. While Canadian farms may have contractual arrangements with feed suppliers and processors, the arrangements most likely and production contracts. In any case, most Canadian production does not take place under the vertically integrated system characteristic of U.S. poultry production.

Canadian firms that are classified specialized poultry producers in the FFS are often large, full-time operations that control all of the production assets. In contrast, U.S. firms that are classified as specialized poultry producers in

Table A-4—Family income items for Carada and the United States, 1991

	Canada	United States
	U.S. Dollars	
Family income:		
All farms	37,598	42,879
Type of farm		•
Grain	36,848	40,881
Dairy	43,402	39,674
Beef	31,883	37,542
Hog	39,415	40,090
Poultry	82,338	54,054
Other	38,037	50,785
Revenue class		
Less than \$43,638	26,335	34,044
\$43,638 to \$87,274	31,206	34,379
\$87,275 to \$218,187	44,150	44,209
\$218,188 and greater	70,124	131,505
Nonfarm income:		
All farms	16,572	31,145
Type of farm		•
Grain	17,470	24,964
Dairy	5,190	13,164
Beef	20,538	35,127
Hog	9,444	23,579
Poultry	19,544	26,176
Other	19,322	36,441
Revenue class		•
Less than \$43,638	23,988	35,468
\$43,638 to \$87,274	13,654	24,210
\$87,275 to \$218,187	9,979	18,674
\$218,188 and greater	8,429	30,171
	Percent	
Percent of family income fr All farms	om farm: 55.9	27.4
Type of farm	33.7	21.4
Grain	52.6	38.9
	88.0	66.8
Dairy Beef	35.6	6.4
	76.0	41.2
Hog	76.3	51.6
Poultry Other	49.2	28.2
	47.2	20.2
Revenue class	8.9	-4.2
Less than \$43,638		29.6
\$43,638 to \$87,274	56.2	
\$87,275 to \$218,187	77.4	57.8
\$218,188 and greater	88.0	77.1

Sources: Farm Financial Survey (Canada), Farm Costs and Returns Survey (United States)

the FCRS are most often small contract growers. Often, the poultry enterprise does not require the operator's services full-time and a large proportion of family income for U.S. poultry contractees is from nonfarm sources. Furthermore, the large U.S. poultry contractors/processors generally do not physically participate in production of the birds. Consequently, they are not counted as farms and the inventory value of the birds and any profits associated with production of the birds are assigned, for statistical purposes, to the food processing sector of the U.S. economy rather than to the farming sector.

These intercountry differences in organizational structure have several implications for interpreting the large differentials in the *per farm* financial characteristics that exist be-

tween Canadian and U.S. farms that specialize in poultry production. First, as consequence of production contract arrangements, large amounts of land and buildings that otherwise would be assets of a few large firms are distributed (owned) as assets of many small contract growers. Second, the inventory value of contract birds does not appear asset of the contractee/grower. The direct effect is that the asset values per farm of U.S. poultry farms are much less than would be estimated in the absence of production contract arrangements.

In a similar vein, the per farm revenue/profit that accrues to the contractor/processor does not appear as part of the revenue/profit of the contractee/grower. The portion of revenue/profit that does accrue to the contractee/grower-essentially a fee representing the labor contribution and implicit rental value of land and buildings--is widely distributed among many small operations rather than concentrated a return to a few large firms. The direct effect is smaller per farm revenue/profit than would be measured in the absence of production contracting.

As a consequence, disparity in the prevalence of production contracting limits the comparability of financial data for U.S. and Canadian poultry farms. The Canadian and U.S. financial data do not encompass identical elements of poultry farm production.

Summary

In 1991, U.S. and Canadian farms were quite comparable in terms of total asset values per farm, average profitability, and family income, when compared on the basis of similar types and sizes. Poultry, and to a lesser extent hogs, were the least similar, while grain farms were the most similar. But, U.S. and Canadian farms also exhibited several differences in financial structure that are so deeply rooted that they transcend farmtype and size categories.

For instance, the amount of debt per farm is consistently higher in Canada, are the debt/asset ratios. Canadian farms use larger amounts of debt, both in dollar amounts and relative to the value of assets. In addition, while the balance sheets of U.S. and Canadian grain, dairy, beef, and "other" farms exhibit comparable amounts of total assets, the composition of those assets is quite different. Excluding hogs and poultry, Canadian farms consistently held higher average values of intermediate assets, while U.S. farms held larger average values of long-term assets. Canadian poultry and dairy farms reported substantial average values for quotas. Such assets are of limited importance in U.S. agriculture.

Canadian farms also appear more profitable, generally exhibiting higher levels of average net cash farm income for all types of farms and for all sizes of farms, except the largest category. Average net farm income a a percentage of assets (a measure of rate of return) is higher in Canada for all types and all sizes. Canadian farms also receive higher levels of direct payments from government programs, both in absolute dollar terms and relative to gross farm revenue. Net cash farm income and rates of re-

turn to farming remain higher in Canada even after adjustment for Canada's higher levels of direct program payments. Direct program payments are a larger percentage of net cash farm income in Canada for every size and type of farm. The profitability of grain farms, however, was quite similar in Canada and the United States.

Even though net cash farm income is higher in Canada than in the United States, the levels of total family income are quite similar. The Canadian advantage in terms of higher net cash farm incomes is offset in the United States

by higher levels of nonfarm income, with the consequent effect that total family income are nearly identical. This implies that Canadian farms as substantially more dependent on farm income, while the U.S. farm families are substantially not dependent on nonfarm income. And, this is the case for each size and type of farm. In Canada, poultry and dairy farms (the two types with supply management) and hog farms were especially dependent on farm income. In the United States, families on dairy farms were most reliant on farm income.

Greenhouse and Nursery Sector Growing

by Cheryl Steele and Roger Strickland 1

Abstract: Greenhouse (floriculture) and nursery (environmental horticulture) receipts have outpaced all other sectors in U.S. agriculture and continue to expand in all States. California is the largest producer but the Southern and Western States will continue to have production and marketing advantages. In 1990, 59 percent of greenhouse and nursery farms were in a favorable financial position, 31 percent were in a marginal financial position, 6 percent were marginally solvent, and 3 percent were vulnerable.

Keywords: Greenhouse and nursery, floriculture, environmental horticulture

In the USDA farm income accounts, greenhouse and nursery cash receipts totaled \$8.9 billion in 1992, ranking seventh among agricultural commodities in the United States. Greenhouse and nursery receipts have outpaced receipts in all other agricultural sectors and continue to expand in all States. In 1990, net farm income per farm for all greenhouse and nursery farms averaged \$53,589. This is four times larger than average net farm income for all farms which averaged \$13,458 in 1990 (table B-1). The average income for greenhouse/nursery farms increased 10 percent annually during the 1987-90 period.

Greenhouse/nursery production (34 percent floriculture, 66 percent nursery) is concentrated on the East Coast (figure B-1), but California has been the leading State for greenhouse/nursery cash receipts since 1960. Several States have taken advantage of the opportunities to achieve growth in the greenhouse and nursery industry. Although California ranks on top (table B-2), greenhouse/nursery products reprevalent on the East Coast where rainfall is abundant, soil is fertile, and temperatures rainfall in the South.

Business, Government, and Housing Demand & Up

Retail expenditures for greenhouse and nursery reached \$38.9 billion in 1991 and are projected to reach \$44 billion or \$170 per capita in 1993 (plant care and other related products and added to the estimate of retail expenditures).

Businesses and Governments are working to enhance parks, highways, office buildings, hotels, and restaurants by buying more flowers, plants, trees, and shrubs. The housing industry is spending more for sod and landscape ornamentals. Personal preference and higher personal disposable incomes leading Americans to buy more cut flowers, bedding plants, and other ornamentals, such as houseplants and outdoor foliage, trees, and shrubs.

Bedding and garden plant sales rising faster than any other category of floriculture and environmental horticulture crops (see box for categories). Grower receipts for bedding and garden plants exceeded \$1 billion in 1990 and re projected to hit \$1.25 billion in 1993. Per capita retail expenditures of bedding and garden plants were estimated at \$17.10 in 1991 compared with \$10.40 in 1986 (4). Increasing demand for bedding/garden plants stems primarily from landscaping contractors, homeowners, institutions, and others needing to maintain the appearance of outdoor environments. Increased interiorscaping of hospitals, malls, office and residential buildings is also expanding demand.

Among greenhouse/nursery operations, bedding and garden plants are second to nursery plants in net cash income (table B-3). Nursery plants constitute the largest subsector in the floriculture and environmental horticulture industry, accounting for approximately half of its grower cash receipts in 1992 (10). Nurseries produce mainly landscaping products. Landscaping products include ornamental and shade trees, evergreens, shrubs, hedges, and groundcovers. Nurseries also produce fruit and nut trees and berry plants of all sorts used for windbreaks and conservation purposes and seedlings for Christmas tree production and reforestation of commercial, public, and private woodlands and forests. American consumers' total expenditures for flowers and potted plants in 1990 were the highest in the world (9).

Demand for greenhouse and nursery products appears recession proof but still sensitive to economic conditions. The industry grew at 11-percent average annual increase from 1982-90, with retail growth in 1990 slowing to only 2-3 percent due to the recession, and the uncertainty of the economy causing delays in housing and construction starts, well retail business starts (4). Landscaping businesses slowed due to the cutback or delayed ground maintenance or property upgrading. As construction activity starts back up, demand for nursery crops will increase.

Grower cash receipts from potted flowering plants reached \$715 million in 1992. Potted flowering plants are becoming increasingly popular for indoor and patio use and for holidays and gift giving, and growers intend to increase

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² Cash receipts are sales from establishments defined to be farms engaged principally in the production of agricultural commodities. Sales ■ the wholesale and retail level include the value of additional services.

production area of most varieties of potted flowering plants.

Grower cash receipts from bedding and garden plants, the largest subsector, reached \$1 billion in 1992. Bedding plants rose 11 percent in 1992. The expanding demand for bedding plants can also be attributed to increased homeowners, commercial buyers, and landscapers.

Foliage plants are made up of many types of green plants for indoor and patio decoration. Grower cash receipts for foliage plants reached \$416 million in 1992. (12)

Seventy-one percent of cut flowers are grown in the Western States. Sixty-six percent of foliage plants, eighty-four percent of cut cultivated greens, forty-one percent of all other environmental crops are grown in the Southern States. Production of potted flowering plants and bedding/garden plants are pretty much evenly distributed across regions in those States where applicable (2).

Reasons for Growth in the Industry

Greenhouse and nursery retail sales have increased in both the national and international markets. Consumer demand has increased with growing U.S. personal disposable incomes (causing personal consumption expenditures to increase) and increasing foreign incomes. Product availability has also served to spark the increase in the consumption of greenhouse and nursery products. Consumers and more readily purchase cut flowers, potted plants, and decorative greens in grocery stores and sidewalk vending stands, as well as at florists. Because improved availability stems from advances in market capabilities (particularly storage and transportation facilities), flowers can be purchased more cheaply.

Growth in greenhouse and nursery receipts can also be attributed to consumer and receipts of the environment, industry diversification into annual and perennial crops offering a greater variety of choices, and the ease of starting up a nursery or related business. Analysts notice a resurgence in consumer demand for plants for indoor benefits to reduce stress and maintain air purity. Nonedible horticulture has proven to provide a good supplemental income or a viable alternative to traditional farming (3) (table B-1).

Analysts estimate that there are approximately 57,000 retail floral outlets in the United States. Grocery stores account for 21,000, but the majority, (about 36,000) are independent retail floral shops. Floral products are the fastest growing category in grocery stores and other mass markets. Floral sales averaged \$28 per square foot per year in the stores, while other produce averaged \$8 to \$12. (8) Grocery store retail sales of flowers and plants in 1986 were \$1.49 billion, or 18 percent of the total horticultural sales.

Financial Characteristics of Greenhouse and Nursery Farms

Although greenhouse and nursery farms can be highly profitable, they are also risky because of high capital require-

ments, fixed costs, and cash expenses. Gross cash incomes for floriculture and environmental horticulture farms are generally higher than other types of farms, but cash expenses are among the highest. (2)

The financial characteristics of greenhouse/nursery operations be examined using data from USDA's Farm Costs and Returns Survey (FCRS). The FCRS is an annual survey that collects data for farm revenues, production expenses, capital purchases, assets, liabilities, and other financial data. Specific production practices are obtained in detail for selected crops in order to analyze operating characteristics. The FCRS currently provides only industry-level farm data for floriculture and environmental horticulture.

From 1987 through 1990, more than 50 percent of greenhouse and nursery farms were in a favorable financial position, meaning a positive net farm income and a debt-to-asset ratio less than .40, which indicates that the farms are able to retain earnings and are in a position to take advantage of investment and expansion opportunities. From 1987-90, the percent of farms in the vulnerable financial position (negative net income and high debt) ranged from 3.4 percent to 10.5 percent. These farms are highly leveraged and exhibit income deficiencies. Highly leveraged positions may have resulted from disproportionate reductions in asset values relative to the amount of outstanding liabilities, increased indebtedness to fund past expansion or cash operating shortfalls or a combination of these. In 1990, 59 percent of 36,793 farms were in a favorable financial position, 31 percent were in a marginal position, 6 percent were marginally solvent and 3 percent were vulnerable. (2)

In 1990, greenhouse and nursery farms, despite ranking seventh in total U.S. cash receipts, were only 2.0 percent of all U.S. farms. Because of greenhouse structures, the farms ur capital rather than land intensive. Average acres per farm were 84, the smallest of all farmtypes. Greenhouse and nursery has the second smallest number of farms after poultry. Eighty-one percent of greenhouse and nursery farms reported individual ownership. (2)

Outlook

Farmers are producing greenhouse/nursery products as an alternative source of income because the returns per farmor net cash farm income per farm-are greater than every other kind of farm (table B-1). Moreover, this type of production can be easily combined with off-farm employment. Domestic production and profits are expected to rise for growers who adopt new technologies and develop aggressive market efforts. At the same time, producers are likely to face greater pressures concerning the use of natural resources and environmental preservation.

Greenhouse/nursery marketing and production opportunities are abundant and offer a profitable alternative to existing farm enterprises -- because the industry is very diversified in annual and perennial crops (many of which require minimal acreage to grow), and because consumer demand

Table B-1-U.S. farms: Gross farm income, expenses, and net farm income, by production specialty, 1987-90

Production specialty and year	Farms	Agricultural sales	Government payments	Other farm income 2/	Gross cash farm income 3/	Cash expenses	Net cash farm incase 5/	Noncash adjustments	Net farm imcomm 7/
	Number			Dol	llars per fa	rm			
All farms 1987 1988 1989 1990 Production specialty—	1,671,786 1,764,086 1,732,996 1,752,125	B 53.100	6,433 5,120 3,986 3,158	4,187 3,878 4,724 4,480	63,022 62,098 66,258 69,293	51,304 51,496 53,523 57,285	11,718 10,602 12,735 12,008	173 546 (938) (1,450)	11,545 10,056 13,673 13,458
Floriculture, environm 1987 1988 1989 1990	34,15 34,94 29,52 36,79	1 113,503 3 161,755	177 17 271	1,275 2,182 2,653 4,690	146,863	78,861 116,580 100,997 131,478	36,094 47,374 45,866 45,712	(3,917) 2,601 (2,662) (7,877)	40,011 44,773 48,528 53,589
Vegetables, fruits, nu 1987 1988 1989 1990	83,37 83,11 88,66 92,76	88,008 5 102,328	1,199 1,235 1,914 1,802	6,919 3,660 6,101 10,416	98,506 92,903 110,343 113,457	86,320 75,458 91,448 96,343	12,186 17,445 18,895 17,114	5,433 1,600 4,839 (5,785)	6,753 15,845 14,056 22,899
Cash grain: 1767 1988 1989 1990	363,70 340,74 366,57 337,51	9 53:117	17,808 15,077 9,824 9,027	4,938 6,195 5,736 4,924	73,074 74,389 75,922 77,167	54,974 56,775 55,852 58,551	18,100 17,614 20,070 18,616	2,457 1,488 1,630 675	15,643 16,126 18,440 17,941
1987 1988 1989 1990	68,01 76,17 62,21 75,47	5 21,835 7 24,708 3 31,320 3 34,040	1,006 984 967 601	800 901 1,845 918	23,641 26,593 34,132 35,559	17,608 18,805 24,637 24,648	6,033 7,788 9,495 10,911	(1,111) (1,715) (2,452) (5,925)	7,144 9,503 11,947 16,836
Cotton: 1987 1988 1989 1990	22,94 20,35 17,23 21,50	8 216 <i>.6</i> 89	36,587 30,043 36,900 18,974	14,194 9,697 20,110 11,353	273,699	128,607 136,910 183,165 157,061	54,229 42,824 90,534 45,208	6,814 8,652 15,330 2,812	47,415 34,172 75,204 42,396
Beef, Hogs, sheep: 1987 1989 1989 1990	720,70 861,24 772,30 804,52	5 36 ,868 8 36 ,853	2,577 2,330 1,775 1,582	2,853 2,550 3,481 2,493	39,385 41,751 42,109 44,858	35,271 41,751 42,109 44,858	4,114 3,077 4,225 4,609	(2,350) (1,322) (1,936) (2,058)	6,464 4,399 6,161 6,667
Poultry: 1987 1988 1989 1990	28,19 27,33 27,33 30,30	9 52.253	960 873 873 182	27,120 29,708 29,708 30,552	117,910 82,834 82,834 101,031	93,181 64,892 64,892 78,365	24,729 17,942 17,942 22,666	7,460 5,400 5,400 4,004	17,269 12,542 12,542 18,662

1/ Includes all crop and livestock commodity sales and net CCC loans. 2/ Includes contractor income 1 other farm-related in 1 3/ Includes crop and livestock sales, contractor income, government payments, and other farm related in 2 4/ Includes all variable and fixed cash expenses. 5/ Gross cash farm income minus cash expenses. 6/ Includes depreciation, labor(noncash benefits), value of inventory change, and nonmoney income. 7/ Net cash farm income plus or minus "other adjustments".

Source: Financial Performance of U.S. farm Businesses, 1987-90, USDA, Economic Research Service, AET 661.

is continuing to grow to allow stable or increasing prices (5). Greenhouse and nursery analysts believe that greenhouse and nursery offers a much brighter future than many other traditional farm commodities, which are heavily subsidized and stand to lose some of their support in coming years.

The greenhouse/nursery industry has the highest gross and net return per farm and is the most input intensive (2). Greenhouse/nursery has had the longest and strongest growth trend in grower cash receipts. Greenhouse/nursery agriculture is expanding rapidly in at least 50 countries, which is substantially impacting U.S. and world production (9). According to industry analysts, the sales of flowers and plants can be directly linked to a country's GDP. As the economy grows, it is likely that consumer demand for flowers and plants will accelerate. Because the U.S. has the world's largest GDP, it has the largest market for cut flowers and plants. U.S. industries are spending a

great deal on lawn services and tree maintenance, exterior landscaping services and interiorscaping, although this estimate is hard to account for because data are not available for schools, golf courses, and public institutions that use their own employees for landscaping. If the total estimated value-added services combined with consumer retail expenditures, the total economic impact from the U.S. greenhouse/nursery industry would range from \$55 to \$60 billion. (9)

Nearness to regional markets gives domestic growers a distinct advantage over their foreign competitors, because it allows them to stay in tune with local market trends and deliver high quality products swiftly and consistently. Different growing seasons for greenhouse/nursery products offer the maximization of land space for farmers.

(Continued on page 40)

An Introduction to Greenhouse and Nursery Products

This industry of live plants is split into two sectors: floriculture and horticulture

Floriculture

Floriculture refers to plants grown for ornamental purposes that generally last for many seasons. The bulk of floricultural products are grown in greenhouses because of higher valued products than outdoor production are in nurseries because of higher yields, controlled environment, multiple short growing seasons, and of hanging plants, and substantial automation.

Bedding and garden plants are young flower or vegetable plants that are sold for outdoor or patio use in flower beds, borders, patio planters, and home gardens. They are handled as annuals, and they complete their life cycle in a year or less. Also included are open acreage vegetable transplants and herbs grown for use as garden plants. Bedding plants are marketed as flats, individual plots, or hanging baskets. Examples:

Geraniums, impatiens, begonias, petunias, marigolds, pansies and vegetable plants.

Cut flowers are primarily grown for their blossoms and are produced from the row area each year. After the flower is cut, the plant is either discarded or used for the production of more flowers, depending on the variety of the plant. Examples: Cut roses, orchids, carnations, and chrysanthemums.

Cut cultivated greens are marketed much like cut flowers and are grown for their showy foliage. Examples: Cut leatherleaf ferns, chamaedorea, and miscellaneous greens.

Potted flowering plants are produced for their decorative shape, size, color, and stem and leaf characteristics and are usually sold by the pot or hanging basket. Included are house plants for indoor or patio use and large specimens used for interiorscaping hotels, restaurants, offices, etc. Examples: Poinsettias, African violets, Easter lilies, and kalanchoes.

Foliage plants are produced for their decorative shape, size, color, and stem and leaf characteristics and are usually sold by the pot or hanging basket. Included are house plants for indoor or patio use and large specimens used for interiorscaping hotels, restaurants, offices, etc. Examples: Ficus, dieffenbachia, schefflera, spathiphyllum, and philodendrons.

Environmental Horticulture

Environmental horticulture (ornamentals) refers to plants grown for environmental well as ornamental purposes that generally last for many seasons.

Nursery plants include plants all stages of growth consisting of trees, shrubs, groundcovers, vines, and fruit and nut plants. Some nursery plants are field-grown and sold as "bare-root" or "bagged and balled" nursery stock while some nursery plants are grown and sold in containers. Sales from plants bought and resold within 30 days by landscape businesses or garden center outlets and cut Christmas trees are excluded. Examples: Deciduous shade trees, flowering trees, and shrubs

Unfinished plant materials include cuttings, "lining-out" stock plus seedlings, tissue-cultured plantlets, and other unfinished plants and propagative material, grown mostly for resale to other growers. Growers purchase rooted cuttings or unpotted plants from a specialist propagator for either "growing on" to a finished state or market-ready size for further propagation of a specific species or variety.

Sod (turfgrass) includes all varieties of specialized grasses cultivated for sale sod for golf courses, homes, parks, businesses, etc. Examples: Fine fescue, tall fescue, Kenucky bluegrass, bermudagrass, buffalo grass, zoysiagrass, St. Augustine grass, and centipede grass.

Bulbs include dried bulbs, corns, rhizomes, and tubers including annual and perennial varieties, flowering and non-flowering types (to be used for forcing a plant or flower). Examples: Tulips, day lilies, crocus, daffodils, dahlias, cannas, and amaryllis.

Flower and vegetable seed is used for growing flowers or vegetable garden plants.

Cut Christmas trees we any evergreen conifer-bearing tree of the pine, spruce, or fir species cut for ornamental purposes, including such species and Douglas fir, Noble fir, Fraser fir, Grand fir, Concolor fir, Balsam fir, Scotch pine, Virginia pine, Eastern white pine, Austrian pine, Red pine, Norway spruce, White spruce, and Colorado blue spruce.

Table B-2—Greenhouse and nursery products: States' rankings for cash receipts, 1992

Rank	States	Value of commodity	Percent of commodity total	Cumulative percent 1/	Percent of State's total for mll commodities	State's total for all commodities
		1,000 dollars		Percent		1,000 dollars
1 2 3 4 5	California Florida Texas Ohio Michigan	1,882,421 1,024,324 628,000 470,541 386,815	20.9 11.3 6.9 5.2 4.3	20.9 32.3 39.2 44.5 48.8	10.3 16.6 5.4 11.2 11.7	18,234,014 6,144,508 11,619,842 4,167,316 3,286,329
5 7 8 9	New York Oregon North Carolina Pennsylvania Oklahoma	375,250 369,618 317,177 304,749 274,000	4.1 4.1 3.5 3.3 3.0	52.9 57.0 60.6 64.0 67.0	12.7 14.8 6.1 8.4 7.5	2,946,039 2,489,821 5,181,017 3,618,490 3,634,931
11 12 13 14	Maryland Alabama Georgia Tow Jersey Washington	208,721 205,781 133,963 181,248 176,570	2.3 2.2 2.0 2.0 1.9	69.3 71.6 73.6 75.7 77.6	15.0 7.2 4.5 27.5 3.9	1,390,765 2,830,062 4,073,125 656,33 4,454,223
16 17 18 19	Illinois Massachusetts Wisconsin Connecticut Tennessee	174,497 159,329 148,338 143,006 130,682	1.9 1.7 1.6 1.5	79.6 81.3 83.0 84.6 86.0	2.2 32.4 2.7 29.2 6.2	7,633,692 491,234 5,499,038 488,746 2,103,471
21 22 21 24 25	Virginia Indiana Minnesota Colorado Hawaii	112,584 91,510 86,565 81,134 78,779	1.2 1.0 .9 .9	87.3 88.3 89.3 90.2 91.0	5.2 2.0 1.2 2.0 13.9	2,134,353 4,505,292 7,082,069 4,038,389 564,151
27 28 29 30	Iowa Missouri Kentucky Idaho Arizona	63,133 62,822 57,850 53,638 48,012	.7 .7 .6 .6	91.7 92.4 93.1 93.7 94.2	.6 1.5 1.8 1.9 2.6	10,329,712 4,123,300 3,221,305 2,815,512 1,835,250
31 32 34 35	Rhode Island Delaware New Hampshire Kansas	44,441 41,250 35,000 34,000 29,579	.4 .4 .3 .3	94.7 95.2 95.5 95.9 96.2	2.9 57.1 5.5 23.6 0.4	1,530,425 72,218 635,762 143,983 7,000,307
36 37 38 38	Louisiana North Dakota Utah Arkansas Vermont	27,692 27,000 26,500 26,240 23,000	.3 .2 .2 .2	96.6 96.9 97.2 97.4 97.7	1.5 .8 3.5 .5 5	1,846,181 3,093,612 738,338 4,602,230 451,898
41 42 43 44 45	Mississippi Maine West Virginia Alaska Nebraska	21,000 18,700 16,500 15,060 15,000	.2 .2 .1 .1	97.9 98.1 98.3 98.5 98.7	.8 3.6 4.8 59.1	2,601,966 513,187 342,548 25,478 8,782,653
46 47 48 49	Montana South Dakota Nevada Wyoming	10,000 7,090 3,060 1,600	.1 .0 .0	98.8 98.8 98.9 98.9	.5 .2 1.1 .2	1,742,408 3,229,480 272,795 773,312
	South Carolina	2/				
	United States	8,998,769		• •	5.2	171,168,411

^{-- =} Not applicable. Numbers may not and due to rounding.

1/ The cumulative percentage is the percent of commodity total for each State and all preceding States. 2/ South Carolina would have appeared within the list of States' rankings, but was excluded to avoid disclosure of confidential information about individual producers.

Table 8-3—Greenhouse and nursery sales and income by all farms reporting and specialty farms, 1997 1/

	Att	farms repo	rting sale	S		For spe	cialty farms	ns			
Commodity	Farms 2/	Gross cash income	Sales 4/	income per farm 5/	FATES 6/	Gross cash income 3/	Sales 4/	Net cash income per farm 5/			
	Number	1,000 d	ollars	Dollars	Number	1,000	dollars	Dollars			
Floriculture: Bedding/garden plants Foliage plants Potted flowering plants Cut flowers and cut greens	11,148 5,155 6,405 4,561	1,528,276 1,208,363 1,300,284 770,309	817,960 603,174 648,240 594,478	66,115 64,356	6,295 2,938 2,993 2,987	828,169 541,174 613,857 600,307	484,788 497,666	39,711 58,512 57,723 53,479			
Environmental Horticulture: Nursery plants Bulbs 5od (turfgrass) Horticultural seeds (flower/veg) Other horticultural products 7/	15,352 559 1,427 1,398 344	2,542,553 129,419 638,294 454,497 33,602	1,991,009 32,957 391,635 78,554 20,528	58,295 106,167 87,750	12,811 225 1,184 311 133	2,015,575 25,522 387,825 55,943 20,443	369,462	52,716 26,311 86,205 66,219 79,714			

^{1/} Data are from special tabulations (ERS/CED) of the 1987 U.S. Census of Agriculture. 2/ All farms reporting sales in each crop category. 3/ Agricultural sales and other farm related income including government payments.
4/ Sales of specific line items. 5/ Net cash income is agricultural sales plus farm-related income, such customwork and cash rents received minus cash production expenses. 6/ Farm types are specified by SIC(Standard Industrial Classification), i.e. farms by principal enterprise activity. 7/ Includes mostly unfinished plants, cuttings, and propagative materials.

Source: USDA/ Economic Research Service/ Commodity Economics Division.

Figure B-1 Greenhouse and nursery cash receipts as a percent of State's total receipts, 1992



The Southern States and California will continue to have advantages in this area because of favorable climates (permitting widespread outdoor production), proximity to major metropolitan area (offering many outlets), availability of workers, and rapidly expanding populations.

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Trends in Costs of Production for Corn, Soybeans, and Wheat, 1975-1991

by Mir Ali 1

Abstract: Variable cash costs in nominal dollars for corn, soybeans, and wheat generally increased between 1975 and 1991. However, read costs (adjusted for inflation) for producing these crops declined, except during 1978-81 when fuel and fertilizer prices rosa sharply. Per bushel real costs also showed a downward trend due to increasing crop yields over time.

Keywords: variable cash costs, production costs, expenses, inflation

Although producing an are of corn, soybeans, or wheat costs more in 1991 than in 1975, did these crops become more costly to produce or is this an illusion because of general inflation over time? This paper analyzes how changes in inflation and technology affected the trend in average production costs on a per-acre and per-bushel basis from 1975 to 1991.

Production costs vary widely among crops and among regions because of the different mix of production inputs. For example, fertilizer and chemicals account for approximately half of the variable expenses for corn. As these costs rise and fall, so do total variable costs. Production costs of corn and wheat are very sensitive to price changes in the fuel, fertilizers, and chemicals. Fuel prices followed by fertilizer and chemical prices were the most volatile compared to prices of other production inputs.

Average prices of farm production inputs doubled between 1975 and 1991. Farm machinery increased the most, followed by fuels, wages, and interest. Prices for fertilizers, chemicals, and farm supplies decreased water years during 1975-91.

Variable cash expenses (referred to a cash costs) per planted acre for corn were between \$80 and \$100 prior to 1979 (figure C-1), rising to \$135 in 1981 as prices for operating inputs, such as fuels and fertilizers, increased sharply. Corn cash costs per acre remained at that level until 1986 when they dropped to \$120 and increased slowly to \$135 in 1991. Cash costs of producing soybeans and wheat followed a similar pattern: gradually increasing until 1986 when they dropped sharply and then increased slowly after 1987. Cash costs for soybeans increased from \$38 in 1975 to \$73 per planted acre in 1991, while cash costs for wheat rose from \$33 to \$52 in 1991.

General price levels in the U.S. economy, as measured by the GDP implicit price deflator, tend to increase each year.

¹ Agricultural economist, USDA, Economic Research Service, Agriculture and Rural Economy Division As the price level has increased (or inflated), the value of a dollar in relation to all domestically produced goods and services has declined. Prices rose at annual rates of 6 to 7 percent between 1976 and 1978, 9 to 10 percent between 1979 and 1981, 6 percent in 1982, and 3 to 4 percent after 1983. This man that a dollar in 1992 worth about half a much as in 1978. If production costs increase more (less) than the inflation rate, real costs would go up (down).

Real per acre cash costs for corn, soybeans, and wheat showed a downward trend (figure C-1). Between 1975 and 1978, when nominal cash costs were stable, real costs per acre of corn and wheat fell. Real production costs for soybeans also fell initially but began to rise in 1977, a year earlier than corn and wheat, primarily due to a significant increase in seed expenses.

A sharp increase in fuel and fertilizer prices from 1978 to 1981 drove up cash costs for all three crops. Fuel and energy prices doubled and fertilizer prices rose more than one-third. Since these crops used more fuel and fertilizers than the economy as a whole, their production expenses increased more than the general level of prices, raising the per arre real costs.

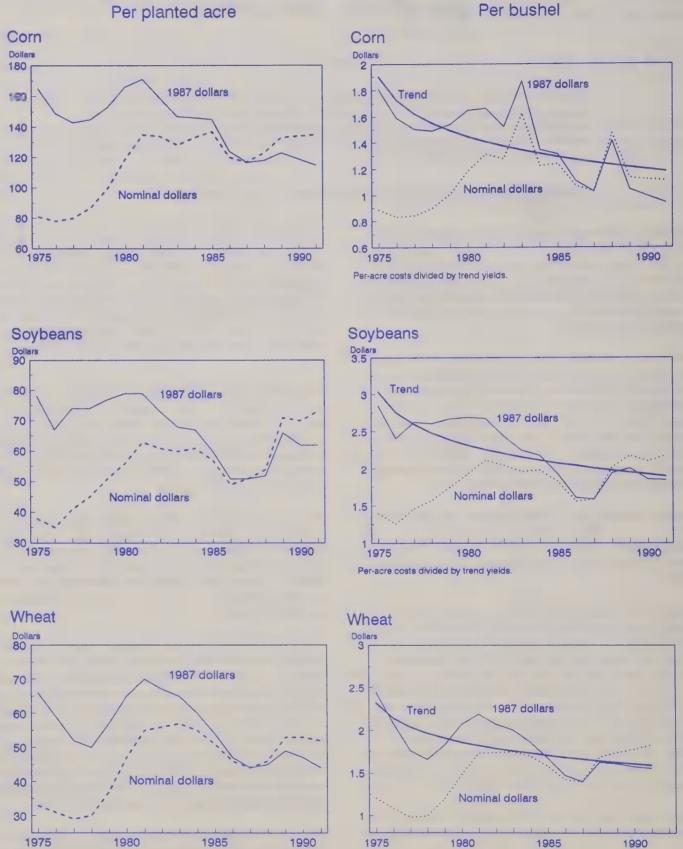
From 1981 to 1982, per are real cash costs fell because nominal prices of farm production inputs were relatively stable while inflation was at about a 5-percent annual inflation rate. Real cash costs per acre continued to decline after 1982 at fertilizer and fuel prices fell and the annual inflation rate dropped to 3 to 4 percent. Per acre cash costs dropped sharply in 1986 as fuel prices fell 19 percent. Real cash costs per acre continued to decline because inflation remained low and prices for farm production inputs were relatively stable, except in 1989, when real costs rose slightly because of increases in seed and fuel prices.

Per acre production costs record costs on the basis of a constant unit-- a planted acre. However, because farm output is in bushels of crops, production costs should also be measured on a bushel basis. Yields, like costs, vary from year to year. They are increase, for example, because of improved production practices and good weather condi-

Figure C-1
Real variable costs per bushel of corn, soybeans, and wheat are trending down

Per planted acro

Per bushel



Per-acre costs divided by trend yields.

tions. Yields vary much more than costs, primarily because of the uncertainty in weather. For example, hot weather and no rain during a growing season can drastically lower the yield after most production costs have been incurred for tilling, fertilizing, planting, and spraying. In 1988, for instance, real variable cash costs per an changed little from the previous year while drought in the major production regions reduced the U.S. yield per planted about 30 percent for corn, 20 percent for soybeans, and 15 percent for wheat. Thus, costs per bushel rose sharply.

Significant increases in yields have occurred since the 1940's due to advances in technology and improved production, cultural, and management practices. The average U.S. corn yield per harvested acre was 34 bushels in the 1940's and 106 bushels in the 1980's. Soybean yields rose from 19 bushels in the 1940's to 30 bushels in the 1980's, and wheat yields from 17 to 33 bushels. The trend in yields over time was measured by regressing yield per planted acre on the year. The 17-year yield trends were linearly upward: corn yields gained 30 bushels, soybean gained 6 bushels, and wheat gained about a bushel and half.

Real cash costs per bushel for each year were calculated by dividing per acre variable costs by trend yields. Per bushel real costs of corn, soybeans, and wheat increased as prices for farm production inputs, especially, fuel, fertilizers, and chemicals exceeded inflation and the upward trend in crop yields. After peaking in 1981, per bushel real costs fell by about 40 percent, rose in 1988, and then declined. The cost changes reflect 1983 corn yields, which were greatly reduced by hot weather, and a drought in 1988 that drastically reduced most crop yields.

Trends in real costs per bushel were measured by regressing the natural logarithm of costs on the year. A log-linear relationship was specified because variable cash costs, though downward sloping, should never reach zero or become negative. Downward trends in per bushel real costs of production are consistent with long-term productivity gains in the agricultural sector. More bushels of corn, soybeans, and wheat were produced in 1991 compared to previous years for each constant dollar of inputs.

Nates on Vield and Costs of Production Estimates

USDA's Economic Research Service (ERS) has estimated costs of production for major field crops annually since 1975. The estimates are published in *Economic Indicators of the Farm Sector: Costs of Production--Major Field Crops*. The most recent edition was published in July 1992 and contains production cost estimates from 1975 to 1990.

ERS bases its costs-of-production estimates on periodic surveys of farm operators from USDA's annual Farm Costs and Returns Survey (FCRS). This survey collects production data for each of the major field crops on a 4-year rotation. Estimates for non-survey years on updated by using secondary data. For more details on updating methodology, refer to ERS publication Major Statistical Series of the U.S. Department of Agriculture, Costs of Production. The most recent FCRS base year was 1989 for wheat, 1990 for soybeans, and 1991 for corn.

Estimates on a planted acre basis. Costs are included only for acreage intended to be harvested for grain. Costs are also included on abandoned acres. Yields per planted acre associated with the cost-of-production estimates differ from those arrived at by dividing total U.S. production by total planted acres published in *Crop Production*. Besides excluding acreage not planted for grain, the costs-of-production survey excludes some States with only small amounts of production.

Variable cash costs were used as a measure of costs of production because these expenses can be directly attributed to a particular crop. Expense items included are seed, fertilizer, chemicals, custom operations, hired labor, fuels, electricity, lubrication, repairs, drying, and purchased water.

Farm Diversification--Still a Problem?

by Charles B. Dodson 1

Abstract: Most commercial farms specialize in only one or two enterprises. Approximately 40 percent of the production of commercial sized farms occurs on those with 95 percent of their production from only two enterprises. The lack of diversification by farmers suggests that diversification is not a viable option or that farmers use other methods to minimize risk.

Keywords: Diversity, specialization, farm enterprises

Despite substantial empirical evidence concerning the benefits of diversification of production, farms tend to specialize in one or two enterprises. This article analyzes the degree of specialization in U.S. farms over 1987-91 by examining the proportion of assets and production controlled by farms which specialize in the production of 1-2 enterprises.

Researchers in production economics have devoted substantial effort to the analysis of farm diversification. Their work has produced product journal articles, extension education programs, and is frequently included in graduate and undergraduate agricultural economics courses. Heady called attention to the diversification problem in a 1952 Journal of Farm Economics article where he stated "Farm leaders, agricultural lenders, agricultural economists, need to get away from high risk one-crop farming, particularly in geographic regions such as the Great Plains and Southeast." (2) Heady described the problem and uncof maximizing profit while minimizing variance of outcome, of putting a floor under the income level or preventing the occurrence of undesirable outcomes.

Developments in portfolio theory by Markowitz and later extended by Sharpe and Lintner enabled incorporation of the dual objectives of profit maximization and minimization of outcome variance into mathematical representation of the farmer's objective function. (5,6) An extension to agriculture by Johnson in 1967 set the stage for a number of articles over the next few years which analyzed farm planning under risk. (3) These studies typically utilized a quadratic programming procedure with huge computational requirements thus reducing their applicability to farm level decisionmaking. Application of the Sharpe's single-index model greatly reduced the computational requirements such that farm managers are extension farm management specialist could easily analyze the benefits of diversification (1,7).

While previous studies have made significant contributions to the literature on diversification, few have specifically ex-

amined farmers' opportunities to diversify. Opportunities to diversify may be greatly limited by production constraints or comparative disadvantages. For example, cotton farms in the southern High Plains tend to be highly specialized. While farmers in this region could diversify into sorghum or soybeans, the reduction in variance of returns would not be sufficient to compensate for the foregone income from cotton. Also, western ranches are highly specialized simply because production of crops is not possible in much of the West.

A previous USDA study used an entropy index to measure how much U.S. farm businesses have diversified among enterprises. (4) This study found cotton farms to be among the most diversified while poultry farms were among the least diversified. It is difficult, however, to develop any implications concerning the structure of production agriculture using an entropy index. What is the importance of specialized farms in aggregate farm production? For example, how much of aggregate farm assets or production is controlled by farms specializing in any or two enterprises?

This study uses data obtained from USDA's Farm Costs and Returns Survey. The focus is on specialized commercial farms, defined as those with greater than 50 percent of production contributed by a single enterprise or related group of commodities. Commercial farms are defined as receiving at least \$50,000 in annual sales, the operator supplies at least 2,000 hours of labor annually, and the operator designated farming as the primary occupation. This definition is more restrictive than commonly assumed. Also, the focus is on annual production instead of sales in order to include all commodities whether sold or not.

Over 30 years have elapsed since Heady's assessment of the need for farmers to decrease their reliance on one-crop farming. Data from the FCRS indicate that a large proportion of commercial farming operations still specialize in only one or two enterprises. Approximately one-third of all commercial farms in the United States received nearly all production from just two enterprises (figure D-1). Also, approximately one-third of the aggregate farm production of commercial farms was from those engaged in only two enterprises (figure D-2).

Agricultural economist, USDA, Economic Research Service, Agriculture and Rural Economy Division.

Figure D-1

About one-third of all commercial farm assets are held by farms which receive 95 percent of their production from only two enterprises

Specialty farm assets as percent of commercial farm essets

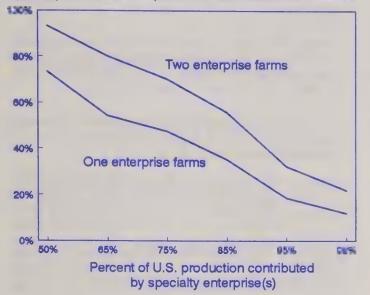


Figure D-2 About 40 percent of U.S. commercial farm production is from farms with 95 percent of their production from only two enterprises Specialty farm production as percent

of commercial farm production

80% Two enterprise farms 60% 40% One enterprise farms 2009 50% 65% 95% 75% 85% 89% Percent of U.S. production contributed by specialty enterprise(s)

Two regions which Heady called attention to, the Southeast and Great Plains, remain characterized by highly specialized farms. In the Southeast and Southern Plains, over 50 percent of the aggregate production of commercial farms is by those with nearly all production from two enterprises (table D-1). The lack of diversification in the Southeast may be due to the importance of poultry in this region. Over 70 percent of the aggregate production by specialized commercial poultry farms is by those with only two enterprises. The lack of diversification in the Pacific region is probably due to the importance of greenhouse and nursery products as well as fruits and nuts. Nursery and greenhouse production is highly specialized with nearly all from farms with only the mue enterprise (table D-2). Among fruit and nut farms, 69 percent of the aggregate production is from farms producing only these commodities.

U.S. agriculture is characterized by large farms accounting for most production. A large share of these large farms specialize in only one or two commodities. Among commercial farms with annual sales above \$250,000, 43 percent of aggregate production is from those with only two enterprises (table D-3). Thus, U.S. agriculture is further characterized by farms which concentrate their resources in the production of one or two enterprises.

The lack of production diversification suggests that diversification is either not a viable option or that diversification is achieved through other means. Several factors may limit a farmer's diversification options: (1) production capability of the land; (2) market potential for products produced, (3) managerial expertise and labor; and (4) specialized equipment required. Also, farmers may use other alternatives to reduce income variability such as production/marketing contracts, participation in Government programs, hedging, options, or insurance.

Poultry and fruits and nuts, which are highly specialized operations, are heavily controlled by production contracts, reducing the producer's income variability. Government programs effectively establish price floors, thus reducing income variability. Another option is that farmers diversify through use of off-farm employment. However, this is more likely to be true of non-commercial farms which were not considered in this study.

The concentration of agricultural production among highly specialized farming operations suggests that research and education programs dealing with production diversification may not have broad applications. Is reduced outcome variability needed? For example, producers of poultry and fruit and nuts may only face minimal outcome variability through the use of production/marketing contracts. Next, the benefits and costs of various options for reducing outcome variability should be examined. In many cases, comparative disadvantage may discourage expanding to a second enterprise. Examples can be seen in the intensive cotton production on the southern High Plains and the intensive dryland wheat production in western Kansas.

Table D-1—Over 10 percent of the production of commercial farms located in the Southern Plains, Southeast, and Pacific regions occurs on farms with 95 percent of their production from only two enterprises

Deschustion	Farms wi production f	Farms with 95 percent of production from 1 or 2 enterprises						
ake States corn Belt lorthern Plains loppalachia loutheast lelta louthern Plains	Percent of farms	Percent of assets	Percent of production					
	Percent							
Northeast Lake States Corn Belt Northern Plains Appalachia Southeast Delta Southern Plains Mountain Pacific	22 27 27 27 40 46 46 40 40 51	20 27 35 43 45 45 48 50	39 24 29 39 35 53 44 50 48 51					

Source: Farm Costs and Returns Survey, 1987-91.

Table D-2—Production of nursery and greenhouse, fruits and tree nuts, and poultry occurs primarily among commercial farms where these commodities where up 95 percent of total farm production

Specialized farmtype	Percent of farms	Percent of assets	Percent of specialized enterprise production
		Percent	
Rice Cotton Tobacco Small Grains Corn-soybeans Fruits & tree ruts Vegetables Nursery & greenhouse Beef, hogs, sheep Poultry Dairy	27 28 18 12 30 63 37 H5	39 19 17 15 31 67 27 83 29 29 23	24 25 31 15 38 80 27 83 31 61

Source: Farm Costs and Returns Survey, 1987-91.

Table D-3—Approximately 43 percent of the farm production of commercial farms with annual sales of \$250,000 or more was by farms with 95 percent of production from two enterprises

Annual sales class	Percent	Percent	Percent
	of	of	of
	farms	assets	production
		Percent	
\$50,000 to \$99,999	33	37	37
\$100,000 to \$249,999	31	34	32
\$250,000 or more	34	37	43

Source: Farm Costs and Returns Survey, 1987-91.

Production diversification appears an a viable alternative to only a portion of U.S. agricultural producers. For those arins in which outcome variability is a problem, research and education efforts might better focus an alternatives such as use of crop insurance, alternative crop rental arrangements, or forward contracting.

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The Real Net Return on Farm Assets, U.S. and Farm Credit System Districts

by W. Gerald Brown and Kenneth W. Erickson 1

Abstract: In periods of rapidly changing farm income and asset values, the real net return on farm assets provides a better museum of the real cost of borrowing than measures which do not include returns from real capital gains or losses.

Keywords: Rate of return, capital gains/losses, Farm Credit System, detri financing

Following Melichar's use of the real net return on farm assets (RNROA) (5), the Economic Research Service recently published State and U.S. estimates of rates of return (including real capital gains or losses) since 1960 (2). Discussion of the real net return on assets and its usefulness in evaluating farm financial performance has been limited (2). External debt financing, real (accrued) capital gains, and off-farm income are the major sources of funds for farm sector investments. This paper evaluates the net benefit of farm debt financing, by Farm Credit System (FCS) district, 1980-91, and for the U.S. as a whole, 1960-93.

The rate of return on assets from current income (ROACI) and the rate of return on equity from current income (ROECI) are widely used indicators of aggregate farm sector profitability. ROACI reflects returns per dollar of owned and borrowed capital and is the ratio of residual income (including interest expenses) to farm assets. ROECI reflects returns per dollar of owned capital only and is the ratio of residual income (excluding interest paid) to farm equity.

The total rates of return on farm assets (ROATOT) and on farm equity (ROETOT) equal the rate of return from current income plus the rate of return on real capital gains. Since farm asset prices reflect expectations of future income growth and hence real capital gains, those gains must be included in computations of the return that the assets have produced for their buyers and owners (6). Thus, in periods of rapidly changing farm income and assets values, such as the 1970's, measures which include capital gains or losses give better estimates of the farm sector's profitability than those that do not.

The RNROA includes both the rate of return on assets from current income and from real capital gains. However, it is net of the real cost of borrowing (average interest rate paid on debt less the general inflation rate).

Yearly inflation (deflation) changes the net cost of borrow-

RNROA is an average, and not a measure of the marginal cost of an additional dollar of borrowed funds at the farm sector level. Nor is it a measure of the marginal cost of funds to an individual farm operator. When the RNROA is positive and debt financing for the "average" sector farm is profitable, some farm operators will have marginal returns in excess of the marginal cost of debt, while others will have marginal returns less than their marginal cost of debt. For some, additional debt financing will be profitable; for others, it will not.

Boom Years of the 1970's

For several decades before the "boom" of the 1970's, farmers found debt financing profitable to purchase farmland and other capital. Initial earnings from land priced to reflect expectations of rising earnings often fell short of servicing the debt incurred to purchase it. However, farmers found that growth in total returns (from current income and from capital appreciation) later rewarded them handsomely for coping with their initial "cash flow problem" (6).

During the boom years of the 1970's farmland buyers and sellers expected that returns to farm assets were on a long-term uptrend. Accordingly, they priced farmland at a relatively high price-earnings ratio. Farmers as a group enjoyed a massive increase in wealth and returns from real capital gains (figure E-1). U.S. farm business equity rose from \$350.7 billion in 1973 to \$816.3 billion in 1980, while returns from real capital gains averaged \$32 billion per year over those years. Since the real net returns on assets (RNROA) were positive, the farmers borrowed heavily to increase their participation in those gains.

ing. If the current interest rate is 5 percent and the rate of inflation over the past year is 3 percent, then the real (inflation-adjusted) cost of borrowing is 2 percent. Real capital gains on farm debt are the decrease (increase) in general purchasing power of the funds owed. Therefore, it is added to interest expenses to estimate the real cost of farm debt (6).

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Measures of Farm Sector Profitability

Real capital gains (losses) "adjusting the nominal capital gains for inflation in that year." Yearly inflation changes the purchasing power of funds tied up in assets (or debt). The real net returns on farm assets and equity me estimated as follows.

For farm assets:

ROACI (rate of return on assets from current income)

- + ROARKG (rate of return m assets from real capital gains)
- = ROATOT (total real return on assets)
- RELCSTDT (real cost of farm debt which is the average interest rate on farm debt minus the real rate of return on farm debt)
- = RNROA (real net return on assets).

or expressed slightly differently

RNROA = (current income + real capital gains on assets)/total farm assets

- (interest + real capital gains and debt)/total farm debt.

For farm equity:

ROECI (rate of return on farm equity from current income)

- + ROERKG (rate of return on farm equity from real capital gains)
- = ROETOT (total real return on equity)

Total returns on farm assets far exceeded the real cost of farm debt (average interest rate on outstanding debt less the general inflation rate). In the late 1970's, the real interest rate on farm debt (adjusted for inflation) actually turned negative since the overall rate of inflation exceeded the nominal interest rate. Melichar (6) noted that although the low real cost of borrowing during these years was an incentive to increase borrowing, the impetus came mostly from the increase in profitability of owning farm assets.

During the 1970's the average interest rate on outstanding debt and the cost of new loans were nearly equal. However, in 1980 at the demand for new loans increased and the average interest rate on outstanding debt was about 9 percent, the interest rate on new loans approached 15 percent. This rise in the cost of new loans significantly raised the cost of debt financing in the 1980's (table E-1).

Farm Sector Recession, 1900-86

Returns to farm assets no longer followed a long-term uptrend in the early 1980's. Land prices fell, producing a price-earnings ratio for farmland consistent with lower expected returns to farm assets from current income. Farm sector equity fell from \$816.3 billion in 1980 to \$567.5 billion in 1986. Real capital gains of the 1970's became real capital losses in the 1980's, averaging -\$65 billion per year

from 1980 to 86 (figure E-1). With net cash flow and returns to farm assets stagnating, many heavily indebted farmers were unable to service or to repay their debt. Many financially stressed and unprofitable farms became insolvent.

Real Not Return on Farm Business Assets

The real net return on farm assets has varied widely from 1910-85 (1). The real capital gains and losses experienced by owners of farmland have overshadowed current income in determining the total return on farm assets (5) (figure E-2). However, changes in returns to farm assets generate the big swings in farm asset values and the resulting capital gains and losses in the farm sector. Melichar has noted that relatively small changes in returns can generate large capital gains and losses (figure E-2).

Real capital gains arise in two different ways. First, changes in current returns, growth rate of returns, and the discount rate cause changes in farm asset prices and corresponding capital gains and losses. Second, if the growth rate of current returns is positive, asset prices will rise even if the growth rate of returns and the discount rate are unchanged (5).

Figure E-1

Real capital gains on farm business equity United States, 1970-93 1/



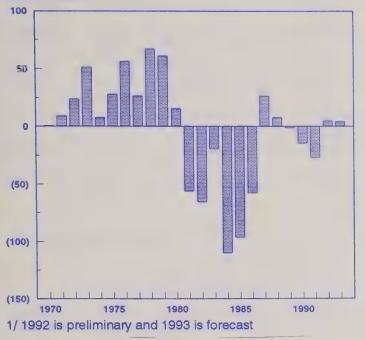


Table E-1—Interest rates and real net return am farm assets, 1980-1991

	assets,	1700 1771			
	Total real rate of return on farm assets	Average interest rate an all debt	Average interest rate on man debt	RNROA	"Current cost" MNRQA 1/
			Percent		
1981 1982 1983	1.4 -4.7 -5.5 -1.5	9.8 11.0 11.3 10.8	13.5 15.8 15.0 12.5	-8.4 -7.9 -11.5 -7.8	-12.0 -20.5 -20.5 -14.0
1984 1985 1986 1987	-9.7 -8.9 -5.1 7.3	10.5 9.6 9.4 9.6	12.9 12.3 11.2 10.3	-16.4 -14.6 -11.2 1.7	-22.6 -21.2 -16.3 -3.2
1983 1989 1990 1991	4.7 4.2 2.5 0.4	10.0 10.3 10.2 9.8	10.5 11.5 10.9 9.7	-1.2 -1.3 -2.8 -5.3	-5.8 -7.3 -8.4 -9.3

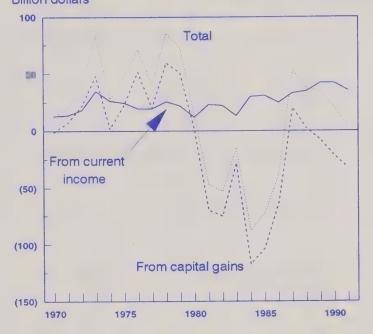
1/ The total real rate of return on farm assets minus the average interest rate on new loans.

For example, the real net return on farm assets fell from 7.2 percent in 1979 to -14.6 percent in 1985. As growth in returns to farm assets from current income slackened, the nominal value of farm assets fell from \$983 billion in 1980 to \$772.7 billion in 1985 (a 3.1 percent average decline per year). Adjusting these nominal capital losses for yearly inflation during this period, the farm sector experienced real capital losses of \$392 billion, or \$65 billion per year. This implied an (average) total rate of return on farm assets of -3.3 percent over this period. Since the real cost of borrowed funds (adjusted for inflation) averaged 3.8 percent, the RNROA averaged -7.1 percent from 1980-85.

Figure E-2

Total returns to farm assets from current income and real capital gains, U.S., 1970-91.

Billion dollars



United States, 1970-93

At the U.S.-level, the RNROA averaged about 7 percent in the 1970's, reaching 19.9 percent in 1973. This is largely due to the large real capital gains accrued on farm business assets. The (average) real cost of farm debt or cost of borrowing for the U.S. farm sector was negative in 1974, as the general inflation rate was greater than the (nominal) interest rate on farm debt. Since the RNROA was positive during the 1970's, debt financing was profitable for the farm business sector **11** a whole (figure E-3).

In 1980, the situation changed dramatically. The real capital gains on farm business assets became real capital losses as farm asset and equity values adjusted to lower expected growth in farm income. Farm debt financing was unprofitable for the farm sector from 1980-86. Although returns to farm assets from current income recovered somewhat from dips in 1980 and 1983, the RNROA for farms overall was negative from 1981-93, except for 1987 (1.7 percent).

Farm Credit System Districts, 1990-91

The RNROA, by FCS System District, and the United States is shown in table E-2. The structure of agriculture varies considerably among FCS districts, reflecting differences in farm size and types of commodities produced (table E-3).

The RNROA was generally positive in the 1970's and negative in the 1980's, with some notable exceptions. Western (-3.7 percent), Springfield (-4.1 percent), Texas (-5.2 percent), and the Columbia (-6.1 percent) FCS district farmers had the highest (1980-85 average) RNROA, despite the fact that Texas real net returns dropped precipitously from 2.1 percent in 1984 to -22.3 percent in 1985

Figure E-3 RNROA, total real rate of return on farm assets, and real cost of farm debt, United States, 1970-93 1/ Percent

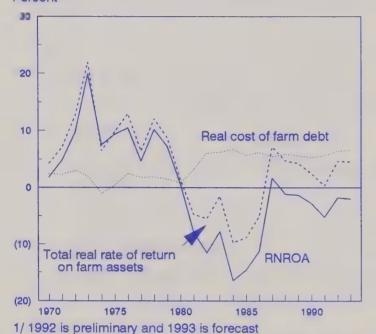


Figure E-4
Percent of farm capital accumulation financed externally (increase in debt) and RNROA, United States, 1960-91
Percent

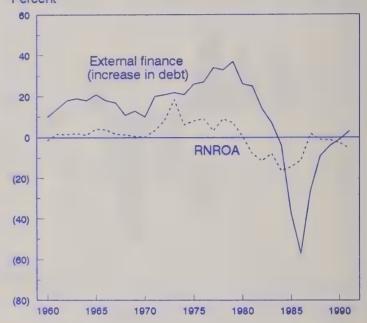


Table E-2-Real net rates of return on farm assets, 1980-91, by Farm Credit System district and United States

	Spri.	Balt.	Colu.	Loui.	Jack.	St.L.	St.P.	Omaha	Wich.	Texas	West.	Spok.	U.S.1/
						Pe	rcent						
1980	-0.52	-4.28	0.81	-2.02	4.86	-1.45	3.11	0.94	-3.48	-2.69	9.85	1.44	0.58
1981	-2.29	-12.62	-8.40	-15.64	-12.08	-12.68	-8.05	-9.79	-7.85	3.65	1.48	-4.15	-7.89
1982	-6.03	-11.94	-3.92	-14.08	-13.96	-16.87	-12.39	-13.69	-12.72	-7.77	-5.77	-9.94	-11.52
1983	-5.45	-9.29	-3.66	-11.31	-6.56	-9.90	-9.55	-13.61	-8.25	0.92	-3.57	-5.65	-7.80
1984	-4.32	-14.12	-7.66	-20.52	-12.58	26.35	-20.30	-26.77	-20.37	2.09	-10.72	-16.04	-16.41
1985	-1.65	-11.15	-7.48	-12.47	-15.33	-13.89	-16.70	-15.01	-20.33	-22.26	-9.63	-16.07	-14.56
1986	2.22	-6.64	-3.03	-12.95	-20.02	-12.22	-13.73	-8.04	-12.74	-16.36	-8.56	-15.56	-11.24
1987	20.37	-5.61	3.26	-1.79	-3.42	0.47	2.16	8.73	-1.25	-7.29	10.04	-3.08	1.68
1988	0.69	0.92	4.07	-4.79	-0.87	-1.38	-2.83	5.89	-2.15	-11.90	1.36	-1.68	-1.17
1989	-4.40	-3.77	4.16	-3.27	-1.15	-2.94	1.04	0.58	-4.41	-9.11	0.91	5.21	-1.34
1990	-5.58	-13.67	-1.30	-6.26	-4.47	-3.74	-0.31	-0.35	-1.61	-7.83	3.73	-1.38	-2.77
1991	-7.93	-6.44	-2.94	-7.82	-2.93	-5.82	-6.51	-2.75	-6.96	-8.33	-2.49	-3.17	-5.25

1/ Spri.=Springfield, Balt.=Baltimore, Colu.=Columbia, Loui=Louisville, Jack.=Jackson, St.L.=St. Louis, St.P.=St. Paul, Wich.=Wichita, West.=Western, Spok.=Spokane.

as land values fell a average of nearly 16 percent in that year and net cash flow after interest expenses fell from \$3.26 billion in 1984 to \$2.31 billion in 1985. From 1986-91, the Springfield (3.4 percent), Columbia (0.2 percent), Western (-1.2 percent), and Omaha (-1.6 percent) FCS district farmers had the highest real net returns on farm assets.

The 3.4-percent average return for the Springfield district, 1986-91, may be misleading. The 20.4-percent RNROA in 1987 is based on a 23-percent rate of return on farm assets from real capital gains, primarily at real estate assets. Therefore, this high average return for Springfield district farmers should be qualified, as land value estimates in the Northeast region in 1987 are greatly influenced by a discontinuous real estate value series.

Farmers in the Western (first both years), Omaha (third and second) Jackson (eighth and third), St. Paul (second and eighth), and Columbia (fourth and third) FCS districts, on average, had the highest total real net returns on farm assets for 1990 and 1991, respectively.

A recent USDA-ERS study of rates of return earned by farm operators, 1987-91, by type of farm, farm size, and region gives results which are generally consistent with these estimates by Farm Credit System district, and helps explain these results (1). This study reports that, on average, cotton farms in the Southeast (Jackson and Columbia FCS districts), large grain farms in the Northern and Southern Plains (portions of the Omaha, Wichita, Texas, St. Louis and St. Paul, and Spokane districts), and vegetable and

Table E-3—Total real ret returns on farm assets, and rankings by FCS district, selected years

			Total	real net retu	rns on fa	arm assets	and rank	of farms	
FCS district	Primary commodities	198	6	19	33	199	0	99	91
		Percent	Rank	Percen	t Rank	Percent	Rank	Percer	nt Rank
Spokane	Cattle; fruit; wheat, oats and other grains;	-15.6	(10)	-1.7	(8)	-1.4	(5)	-3.2	(5)
Western	Fruit; vegetables, nursery products; dairy; part-time cattle; cotton (California)	-8.6	(5)	1.4	(3)	3.7	(1)	-2.5	(1)
Chaha	Cattle; wheat; corn, soybeans, hogs;	-8.0	(4)	5.9	(1)	-0.4	(3)	-2.8	(2)
Wichita	Cattle; wheat, sorghum; sheep and other livestock	-12.7	(7)	-2.2	(9)	-1.6	(6)	-7.0	(9)
Texas	Cattle; cotton; dairy; nursery products; poultry	-16.4	(11)	-11.9	(12)	-7.8	(11)	-8.3	(12)
St. Louis	Corn, soybeans, hogs; part-time cattle; other crops;	-12.2	(6)	-1.4	(7)	-3.7	(7)	-5.8	(6)
St. Paul	Corn, soybeans, hogs; dairy; part-time cattle; other crops;	-13.7	(9)	-2.8	(10)	-0.3	(2)	-6.5	(8)
Louisville	Tobacco; corn, soybeans, hogs; part-time cattle; vegetables and nursery; sheep and other livestock;	-13.0	(8)	-4.8	(11)	-6.3	(10)	-7.8	(10)
Jackson	Poultry; part-time cattle; cattle, cotton; corn, soybeans, hogs; soybeans	-20.0	(12)	-0.9	(6)	-4.5	(8)	-2.9	(3)
Springfield	Dairy; vegetables; nursery;	2.2	(1)	0.7	(5)	-5.6	(9)	-7.9	(11)
Baltimore	Part-time cattle; poultry; dairy (Pennsylvania)	-6.6	(3)	0.9	(4)	-13.7	(12)	-6.4	(7)
Columbia	Poultry: tobacco; vegitables; fruit; other crops; sheep, cattle, other livestock;	-3.0	(2)	4.1	(2)	-1.3	(4)	-2.9	(3)

nursery farms located in the western U.S. had relatively higher average returns on assets, 1987-91.

Real Net Returns on Farm Business Assets, 1992-93

The total real net returns on farm assets are forecast to rise from -5.2 percent in 1991 to -1.8 percent in 1992 (table E-3, figure E-3). This is primarily due to a forecasted rise in total returns to farm assets from about \$3 billion in 1991 to \$40 billion in 1992. As a result, the total rate of return on farm assets (including real capital gains) is forecast to rise from 0.4 to 4.7 percent. The real cost of farm debt is forecast to rise from 5.6 percent in 1991 to 6.4 percent in 1992, mainly because of a slight fall in interest rates on new loans.

The RNROA is forecast to fall slightly to -2 to -3 percent in 1993. This is primarily due to a forecast dip in returns to farm assets from current income, and to sluggish farm asset appreciation.

Conclusions

Farm price support and credit programs, as well as U.S. macroeconomic policies, affect the extent to which farm

operators use external debt, real capital gains, and non-farm equity capital to finance their investments.

The percent of farm capital accumulation financed externally (by an increase in farm debt) fell precipitously from 1980-86, but is again approaching "normal" levels the real net return on farm assets approaches returns earned in the early 1960's (figure E-4). Real net returns on farm assets earned by farmers differ in the various Farm Credit System districts. Farmers in the Western, Omaha, and Columbia districts have relatively higher real net returns to farm assets. These differences reflect the varying structure and performance of farms across the country.

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Table E-4-Real met returns um farm assets, U.S., 1990-93

Item	1990	1991	1992F	1993F
		Billion	dollars	
1. Returns to operators	45.3	38.9	46	55 to 57
2. Well rent to nonoperator landlords	9.2	9.7	10	9 to 11
3. Interest expenses	12.6	11.5	11	12 to 14
4. Income returns to farm and and operators' labor and management 1/	67.2	59.6	67	68 to 70
5. Total returns to farm masels	20.9	-0.7	27	26 to 30
From current income (1+2+3-4)	42.2	35.6	34	37 to 41
From real capital gains	-21.3	-36.3	-7	-10 to -12
6. (Average) value of farm assets	839.1	846.2	853	863 to 873
		Pe	ercent	
7. Total real rate of return on farm assets (5/6)	2.1	-0.5	3.1	2 to 3
From current income	4.6	3.8	3.9	3 to 5
From real capital gains	-2.5	-4.3	-0.8	-2 to 0
8. Real cost of farm debt	4.2	4.2	4.9	6 to 7
+ Average interest rate	9.2	8.3	7.8	9 to 10
- Rate of return on assets from real capital gains	5.0	4.1	2.9	2 to 3
9. RNRGA (7-8)	-2.2	-4.6	-1.8	-3 to -5

F = Forecast. 1/ Returns to operators' labor equals hours of operator and unpaid family labor times the average hourly cash war rate. Returns to management equals 5 percent of the sum of cash receipts plus net inventory change plus Government payments minus livestock and feed purchases.

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Cash receipts Crops 1/ Livestock Direct Government payments Farm-related income 2/ Gross cash income (1+2+3) Cash expenses 3/,4/ NET CASH INCOME (4-5) Deflated (1987\$) 5/ m income statement	1968	1989	1990	1991	1992P	199	93F
			Billion de	ollars			
Cash income statement							
1. Cash receipts	151.2	161.2	170.0	168.7	171		to 177
Crops 1/	71.7	77.0	80.1	81.9	25		to 88
Livestock	79.4	84.1	89.8	86.8	86	86 1	to 90
2. Direct Government payments	14.5	10.9	9.3	8.2	9	11 1	to 15
3. Farm-related income 2/	7.3	7.8	7.6	7.8	7	6 1	to 8
4. Gross cash income (1+2+3)	172.9	179.8	186.8	184.7	188	190 1	to 190
5. Cash expenses 3/,4/	118.4	125.1	130.9	131.4	130	126	to 134
6. NET CASH INCOME (4-5)	54.5	54.7	55.9	53.3	57		to 67
Deflated (1987\$) 5/	52.4	50.5	49.4	45.3	43	46 1	to 54
arm income statement							
7. Gross cash income (1+2+3)	172.9	179.8	186.8	184.7	187	190 1	to 198
8. Nonmoney income 6/	6.3	6.3	6.2	5.9	6		to 7
9. Inventory adjustment	-3.4	4.8	3.4	3	4	-5 1	to -1
10. Total gross income (7+8+9)	175.8	190.9	196.4	190.3	198	193	to 202
11. Total expenses	137.0	144.0	149.9	150.3	149	146	to 155
12. NET FARM INCOME (10-11)	38.8	46.9	46.5	40.0	49	43	to 50
Deflated (1987\$) 5/	37.3	43.3	41.1	34.0	39	34	to 41

P= preliminary; F = forecast. Totals may not add due to rounding.

Appendix table 2—Average income to farm operator households, 1988-93

Item	1988	1989	1990	1991	1992P	1993F				
		Dollars per operator household								
Farm income to household 1/	4,201	5,796	5,742 2/	4,397	4,337	n/a				
Self-employment farm income	3,386	4,723	4,973	2,283	2,829	n/a				
Other farm income to household	364	1,073	768	2,114	2,010	n/a				
Plus: Total off-farm income Income from wages, salaries, and	28,829	26,223	33,265	31,638	35,731	n/a				
non-farm businesses Income from interest, dividends,	22,220	19,467	24,778	23,551	27,022	n/a				
transfer payments, etc.	6,610	6,756	8,487	8,087	8,709	n/a				
Equals:										
Farm operator household income	33,030	32,019	39,007	36,025	40,068	n/a				

P = preliminary; F = forecast. n/a = not available. Data for 1988-90 are expanded to represent the farm operator households surveyed in USDA's Farm Costs and Returns Survey; data for 1991-92 are expanded to represent the total number of U.S. farms and ranches. Totals may not add due to rounding.

^{1/} Includes CCC loans. 2/ Income from custom work, machine hire, recreational activities, forest product sales, and other farm sources. 3/ Excludes depreciation and perquisites to hired labor. 4/ Excludes farm households. 5/ Deflated by the GDP implicit price deflator. 6/ Value of home consumption of farm products and imputed rental value of operator dwelling.

the total number of U.S. farms and ranches. Totals may not add due to rounding.

1/ Farm income to the household equals self-employment income plus amounts that operators pay themselves and family members to work on the farm, income from renting out acreage, and net income from a farm business other than the one being surveyed. 2/ If the additional 350,000 small farms included in the 1991 analysis mentioned in the 1990 analysis, farm income to the household in 1990 would be approximately \$4,600.

Appendix table 3-Relationship of net cash to net farm income, 1988-93

Item	1988	1989	1990	1991	1992P	1993/
Gross cash income Minus cash expenses	172.9 118.4	179.8 125.1	186.8 130.9	184.7 131.3	188 130	170 to 177 126 to 134
Equals net cash income	54.5	54.7	55.9	53.4	57	58 to 67
Plus nonmoney income Gross rental value of dwelling Value of inventory change	6.3	6.3	6.2	5.9 3	6	6 to 7 -5 to -1
Minus noncash expenses Labor perquisites Capital cons. exc. dwellings Landlord capital consumption 1/	15.7 -1.0	16.0 -1.4	.5 15.9 -1.4	.6 16.0 -1.3	1 16 -1	-1 to 1 15 to 17 -2 to 1
Minus dwelling expenses Capital consumption Interest Taxes Repair & maintenance Insurance	1.5 .5 .6	3.8 1.8 .6 .7	3.9 1.7 .6 .6	3.9 1.7 .7 .6 .7	2	3 to 5 1 to 3 0 to 2 0 to 2 0 to 2 1 to 1
Equals met farm income	38.8	46.9	46.5	40.0	49	43 to 50

Appendix table 4—Cash receipts, 1988-93

Item	1988	1989	1990	1991	1992P	1993F
Onen acceleta 44			Billion de	ollars		
Crop receipts: 1/ Food grains Wheat Rice	7.5 6.4 1.1	8.2 7.3 0.9	7.5 6.4 1.1	7.4 6.3 1.1	9 8 1	7 to 9 6 to 8 0 to 1
Feed grains and hay Common Sorghum, barley, and oats	14.3 8.9 2.2	17.1 11.4 2.3	18.7 13.4 2.0	19.0 14.4 2.1	19 15 2	18 to 22 13 to 15 1 to 3
Oil crops Soybeans Peanuts	13.5 12.1 1.1	11.9 10.5 1.1	12.3 10.8 1.3	12.7 11.0 1.4	13	13 to 15 12 to 14 1 to 2
Cotton lint and seed Tobacco Fruits and nuts Vegetables Greenhouse a nursery	4.5 2.1 9.2 9.8 7.1	5.0 2.4 9.3 11.5 7.8	5.5 2.7 9.4 11.5 8.5	5.7 2.9 9.9 11.5 8.8	6 3 10 11 9	4 to 6 2 to 4 9 to 11 10 to 13 9 to 10
TOTAL CROPS	71.7	77.0	80.1	81.9	85	👪 to 👪
ivestock receipts: Red Tals Cattle and calves Hogs Sheep and lambs	46.5 36.8 9.2	46.9 36.9 9.5	51.9 39.9 11.6	51.1 39.6 11.0	48 38 10	46 to 54 37 to 42 10 to 11 0 to 1
Poultry and Page Broilers Turkeys Eggs	12.9 7.4 2.0 3.1	15.4 8.8 2.2 3.9	15.2 8.4 2.4 4.0	15.1 8.4 2.3 3.9	15 9 2 3	14 to 14 9 to 11 2 to 3 2 to 4
All dairy products	17.6	19.4	20.1	18.0	20	18 to 20
TOTAL LIVESTOCK	79.4	84.1	89.8	86.8	86	86 to 90
TOTAL RECEIPTS	151.2	161.0	170.0	168.7	171	170 to 177

preliminary; F = forecast. = less than \$500 million. Totals may not midd due to rounding.
1/ Includes sugar, seed, and other miscellaneous crops.

P = preliminary; F = forecast.

1/ Sector capital consumption minus landlord capital consumption equals net capital consumption excluding dwellings.

Appendix table 5—Farm production expenses, 1988-93

Item	1988	1989	1990	1991	1992P	1993F
			Billion	dollars		
Farm-origin inputs	37.1	38.3	39.7	38.7	39	37 to 41
Feed	20.2	20.7	20.4	19.3	20	18 to 22
Feeder livestock	12.8	13.1	14.8	14.3	14	12 to 16
Seed	4.1	4.4	4.5	5.1	5	4 to 6
Manufactured inputs	19.0	20.6	22.0	23.2	23	21 to 25
Fertilizer	7.7	8.2	8.2	8.7	3	7 to 11
Fuels and oils	4.8	4.8	5.8	5.6	5	4 to 7
Electricity	2.4	2.6	2.6	2.6	3	2 to 4
Pesticides	4.1	5.0	5.4	6.3	6	6 to 8
Total interest charges	14.3	13.8	13.3	12.1	11	10 to 14
Short-term interest	6.7	6.7	6.5	6.1	6	4 to 7
Real estate interest	7.6	7.2	6.7	6.0	6	5 to 7
Other operating expenses	36.6	39.5	42.4	43.9	43	41 to 46
Repair and maintenance	7.7	8.4	8.6	8.6	8	8 to 10
Labor expenses	11.0	11.9	14.0	13.9	14	12 to 16
Machine hire & custom work	2.5	2.9	3.0	3.1	3	2 to 4
Animal health	1.3	1.5	1.5	1.4	2	1 to 3
Marketing, storage & transportation	3.5	4.2	4.2	4.7	5	3 to 5
Miscellaneous operating expenses	10.6	10.5	11.2	12.1	11	₽ to 13
Other overhead expenses	30.1	31.8	32.5	32.4	33	32 to 35
Capital consumption	17.4	17.9	17.7	17.6	15	16 to 20
Taxes	5.0	5.2	5.7	5.6	6	5 to 7
Net rent to non-operator landlords	7.7	8.7	9.1	9.1	10	9 to 11
Total production expenses	137.0	144.0	149.9	150.3	149	146 to 15
Noncash expenses	16.2	16.6	16.4	16.5	16	16 to 18
Labor perquisites	.5	.5	.5	.6	1	.5 to 1
Capital consumption exc. dwellings	15.7	16.1	15.9	16.0	16	15 to 17
Landlord capital consumption 1/	-1.0	-1.4	-1.4	-1.3	-1	-2 to 1
Dwelling expenses	3.5	3.7	3.9	3.9	4	3 to 5
Capital consumption	1.7	1.8	1.7	1.7	2	1 to 3
Interest	.5	.6	.6	.7	1	0 to 2
Taxes	.5	.6	.6	.6	1	0 to 2
Repair & maintenance	.6	.7	.6	.7	1	0 to 2
Insurance	.2	.2	.2	.2		0 to 1
Cash expenses 2/	118.4	125.1	130.9	131.4	130	126 to 13

P= preliminary; F = forecast. = less than \$500 million.

1/ Sector capital consumption minus landlord capital consumption equals net capital consumption excluding dwellings. 2/ Total production expenses minus noncash and operator dwelling expenses.

Appendix table 6—Farm income distribution by selected enterprise type, 1991-93 1/

		Crops				Livestock				
Item	Total crops	Cash grain 2/	Tobacco	Cotton	Fruit/nut/ vegetable	Total livestock	Red meat	Poultry	Dairy	
lumban of farms			- 14		Thousands					
Number of farms: 1991 1992 1993	859 856 853	398 397 395	111 110 110	22 22 22	118 117 117	1,246 1,240 1,237	924 920 917	45 45 45	150 149 148	
Income: Cash receipts— Crops				В	illion dolla	11 11 11				
1991 1992 1993	75.7 77.7 78	31.0 32.7 34	3.0 3.1 3	5.1 5.1 5	19.8 19.5 20	6.2 6.5 7	3.7 3.9 5	0.2 0.2 0	0.8 0.9 1	
Livestock 1991 1992 1993	4.7 4.5 5	3.3 3.1 3	0.2 0.2 0	0.1 0.1 0	0.2 0.1 0	82.1 81.8 84	28.9 27.4 28	15.1 15.4 16	19.5 21.1 20	
Direct Government payments— 1991 1992 1993	5.9 6.6	4.5 5.0 7	0.0 0.1	0.5 0.6 1	0.1 0.1 0	2.3 2.6 4	1.7	0.0	0.3 0.3 1	
Gross cash income— 3/ 1991 1992 1993	90.0 92.2 95	40.4 42.4 46	3.4 3.5 3	6.0	20.4 20.1 20	94.7 94.8 98	36.6 35.4 38	15.3 15.6 17	21.6 23.2 23	
Cash expenses— 1991 1992 1993	60.2 55.9 57	25.7 25.0 25	2.9	3.6 3.3 3	12.2 10.2 10	71.0 74.3 75	32.4 37.3 38	8.8 9.3 9	16.9 20.1 20	
Net cash income— Current dollars 4/ 1991 1992 1993	29.8 36.3 38	14.7 17.4 21	0.5 1.1 1	2.4	8.2 9.9 10	23.7 20.5 23	4.3 -2.0 0	6.6 6.3 7	4.7 3.1 3	
Deflated (\$1987) 1991 1992 1993	25.3 30.0 31	12.5 14.4 17	0.5 0.9 1	2.0	7.0 8.2 8	20.1 17.0 19	3.6 -1.6 0	5.6 5.2 6	4.0 2.6 2	
salance sheet: 5/										
Farm assets— Real estate 1991 1992 1993	289.0 293.6 298	111.0 112.8 115	18.3 18.6 19	7.3 7.4 7	86.9 88.3 90	333.8 339.2 345	235.1 238.8 243	12.9 13.1 13	52.0 52.8 54	
Nonreal estate 1991 1992 1993	98.0 100.1 101	51.2 52.4 53	4.9 5.0 5	5.2 5.3 5	13.5 13.7 14	120.3 122.9 123	74.9 76.5 77	3.5 3.6 4	28.2 28.8 29	
Total liabilities— 1991 1992 1993	68.8 69.2 70	36.0 36.2 37	2.3 2.3 2	3.3 3.3 3	13.2 13.3 14	70.0 70.4 72	36.4 36.6 37	3.8 3.8 4	20.2 20.3 21	
Debtate					Percent					
Debt-to-asset ratio— 1991 1992 1993	17.8 17.6 18	22.2 21.9 22	10.1 9.9 10	26.2 25.9 26	13.2 13.1 13	15.4 15.2 15	11.8 11.6 12	23.2 23.0 23	25.1 24.8 25	

¹⁹⁹² estimates are preliminary; 1993 estimates are forecast. * = less than \$500 million. Numbers are rounded.

1/ Farm types are defined as those with 50 percent or more of the total value of production accounted for by a specific commodity or commodity group. 2/ Includes farms earning at least half their receipts from sales of wheat, corn, soybeans, rice, sorghum, barley, oats, or a mix of cash grains. 3/ Equals cash receipts + government payments + farm related income. 4/ Equals gross cash income minus cash expenses. 5/ Excludes farm households.

Item	1988	1989	1990	1991	1992P	1993F
			Bi	llion dolla		
Income and total returns: 1. Gross farm income 1/ 2. Wages and perquisites to hired labor 3. Other operating expenses,	171	186	191	186	197	197 to 199
	10	11	12	12	12	10 to 12
	86	92	96	98	97	97 to 100
excluding interest 4. Capital consumption 5. Net income from assets and operators' labor and management (1-2-3-4) 2/ 6. Income imputed to	15	15	15	15	15	14 to 16
	60	69	68	61	73	72 to 75
operators' labor and management 7. Residual income to farm assets (5-6) 8. Real capital gains on assets 9. Total return to assets (7+8)	26	28	30	29	40	38 to 42
	34	40	39	32	33	32 to 35
	2	-8	-21	-36	-7	-9 to -12
	36	33	17	-4	27	21 to 25
0. Interest paid	14	13	13	11	11	12 to 14
1. Real capital gains on debt	6	6	7	6	4	3 to 5
2. Total return to equity (9-10+11)	28	26	12	-10	20	13 to 15
3. Real capital gains on equity (8+11) 4. Residual income to farm equity (12-13)	8	-1	-14	-31	-3	-5 to -8
	20	27	26	21	23	19 to 22
alance sheet: 5. Assets 6. Debt 7. Equity (15-16)	801	830	848	844	861	870 to 880
	139	137	137	139	138	137 to 143
	662	693	712	705	723	730 to 740
and the second second second second				Percent		
ates of return and interest rates 8. Rate of return on assets (ROA) (7/15) 9. Real capital gain on assets (8/15) 0. Total real return on assets (18+19)	4.2 0.2 4.5	4.9 -0.9 3.9	4.6 -2.5 2.1	3.8 -4.3 -0.5	3.9 -0.8 3.1	3 to 5 -2 to 0 2 to 3
21. Average interest rate paid on debt (10/16)	9.8	9.7	9.2	8.3	7.8	9 to 10
22. Real capital gains on debt (11/16)	4.2	4.7	5.0	4.1	2.9	2 to 3
23. Real cost of debt (21-22)	5.6	4.9	4.2	4.2	4.9	6 to 7
24. Rate of return on equity (ROE) ((7-10)/17)	3.1	3.9	3.7	3.0	3.1	2 to 4
25. Real capital gain on equity ((8+11)/17)	6	-2.0	-4.0	-6.0	-1.5	-3 to -1
26. Total real return on equity (24+25)	2.5	1.9	-0.3	-3.0	1.7	0 to 2
27. Net return on assets (NROA) (18-21)	-5.6	-4.8	-4.7	-4.4	-3.9	-5 to -6
28. Real net return on assets (RNROA) (20-23) 3/	-1.1	-1.0	-2.2	-4.6	-1.8	-3 to -5

P = preliminary; F = forecast. Numbers may not add due to rounding.
1/ Excludes operator dwellings. 2/ Numbers in parentheses show components required to calculate a given item.
3/ When total real rate of return on assets exceeds total real cost of debt, debt financing is advantageous.

Appendix table 8-Farm business balance sheet, 1988-93

Item	1988	1989	1990	1991	1992P	1993F
			Bil	lion dolla	ars	
Farm assets	801.1	829.8	848.4	843.9	861	870 to 880
Real estate Livestock and poultry Machinery and motor vehicles Crops stored 1/ Purchased inputs Financial assets	595.5 62.2 81.2 23.3 3.5 35.4	615.7 66.2 85.1 23.4 2.6 36.8	628.2 70.9 85.4 22.8 2.8 38.3	623.2 68.1 85.8 23.6 2.6 40.3	633 71 86 24 4	640 to 650 70 to 74 83 to 87 23 to 27 2 to 4 43 to 47
Farm debt	139.4	137.2	136.8	138.8	138	137 to 143
Real estate 2/ Nonreal estate	77.6 61.7	75.4 61.8	73.7 63.1	74.4 64.3	75 63	73 to 77 63 to 67
Farm equity	661.7	692.6	711.6	705.1	723	730 to 740
Calanted nations			F	Percent		
Selected ratios: Debt-to-asset Debt-to-equity Debt-to-net cash income	17.4 21.1 255.9	16.5 19.8 250.6	16.1 19.2 244.7	16.4 19.7 260.2	16.1 19.1 243.5	15 to 17 18 to 20 220 to 230

P = preliminary; F = forecast.

1/ Non-CCC crops held on farm plus value above loan rate for crops held under CCC. 2/ Includes CCC storage and drying facility loans.

Appendix table 9—Farm financial ratios: liquidity, solvency, profitability, and financial efficiency, 1988-93

Ratios	1988	1989	1990	1991	1992P	1993F
				Ratio		
Liquidity ratios:						
Farm business debt service coverage 1/	2.27	2.32	2.38	2.33	2.5	2.4 to 2.
Debt servicing 2/	0.17	0.16	0.15	0.15	0.1	.1 to .2
Times interest earned ratio 3/	3.72	4.39	4.50	4.31	4.2	3.2 to 3.
Solvency ratios:				Percent		
Debt/asset 4/	17.4	16.5	16.1	16.4	16.1	15 to 17
Debt/equity 5/	21.1	19.8	19.2	19.7	19.1	18 to 20
Profitability ratios:				Percent		
Return on equity 6/	3.1	3.9	3.7	3.0	3.1	2 to 4
Return on assets 7/	4.2	4.9	4.6	3.8	3.9	3 to 5
Net farm to gross cash farm income 8/	22.4	26.1	24.9	21.7	28.0	26 to 27
Financial efficiency ratios:				Percent		
Gross ratio 9/	68.5	69.6	70.1	71.1	68.9	66 to 68
Interest to gross cash farm income 10/	7.9	7.4	6.8	6.2	6.3	7 to 8
Asset turnover 11/	22.0	22.1	22.3	21.8	20.0	19 to 21
Net cash farm income to debt ratio 12/	37.0	43.5	43.1	37.4	42.3	40 to 44
				Ratio		
Financial leverage index 13/	0.72	0.80	0.80	0.77	0.81	.7 to .8

P = preliminary; F = forecast.

^{1/} Assesses the ability of farm businesses to repay both principal and interest. 2/ Indicates the proportion of gross cash farm income needed to service debt. 3/ Shows the farm sector's ability to service debt out of net income. 4/ Shows the proportion of all assets that are financed with debt. 5/ Measures the relative proportion of funds provided by creditors (debt) and owners (equity). 6/ Measures the ability of farm sector management to realize an adequate return on the capital invested by the owner(s). 7/ Measures how efficiently managers use farm assets. 8/ The profit margin indicates profits earned per dollar of gross income. 9/ Gives the proportion of gross cash farm income absorbed by production expenses (claims on farm businesses). 10/ Gives the proportion of gross cash farm income committed to interest payments. 11/ Measures the gross farm income generated per dollar of farm business assets. 12/ Indicates the burden placed on net cash farm income to retire outstanding debt. 13/ Indicates whether the use of financial leverage is advantageous.

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